



Unternehmen für Bildung.

GUIDE OF THE IMPLEMENTATION OF EQF IN THE FOOD SECTOR

food-fit project

FOOD-FIT
Methodological proposals to facilitate
the implementation and development
of the European Qualifications Framework (EQF)
for the food sector in the EU
147627-LLP-1-2008-1-ES-KA1EQF/2008-4524

**FOOD-FIT PROJECT
147627-LLP-1-2008-1-ES-KAI1EQF/2008-4524
LIFELONG LEARNING PROGRAMME**

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1. PRESENTATION

Food-fit Project «Methodological proposals to facilitate the setting up of the European Qualifications Framework (EQF) in the food sector of the European Union» general objective is to develop, from the perspective of social agents and companies, a methodology and a set of tools which shall facilitate the implementation and the development of the European Qualifications Framework (EQF) in the food sector of the EU.

This project is an initiative promoted by the Institute of Training and Social Studies (IFES) within the Lifelong Learning programme of the European Commission, with process number 147627-LLP-1-2008-1-ES-KA1EQF/2008-4524 for the period 2009 to 2011.

Food-fit is being undertaken in Germany, Bulgaria, Spain, France and Ireland, with the participation of the following organisations: Berufsbildungswerk Gemeinnützige Bildungseinrichtung des DGB GmbH - bfw (Germany), EUROPROJECT (Bulgaria), EUROQUALITY (France), Institute for the Development of Employee Advancement Services - IDEAS (Ireland) and Agrofood Federation FTA-UGT (Spain).

Experts from the following organisations have collaborated in this project, contributing with quality information, which has been very important for the development of the contents in this report: Public Administrations: Instituto Nacional de las Cualificaciones, INCUAL (Spain). Training centres: Fundación de Estudios Agroalimentarios, FESSA (Spain). Consultants: MIRA Soluciones (Spain). Companies: Danone (Bulgaria), Barena (Bulgaria), Vinprom Sliven (Bulgaria), Alliance 7 (France), Ets Lefevre (France), Glanbia Foods (Ireland), Kerry Foods (Ireland), Nestlé (Spain), Danone (Spain), Heineken (Spain). Entrepreneur organizations: L'ANIA, l'Association Nationale des Industries Alimentaires (France), Fundación Asturiana de la Carne (Spain). Trade Unions: Berufsbildungswerk Gemeinnützige Bildungseinrichtung des DGB GmbH (Germany), Gewerkschaft NGG, Hauptverwaltung (Germany), Services Industrial Technical Professional Union, SIPTU (Ireland), Federación Agroalimentaria FTA-UGT (Spain). Universities: Departamento de Pedagogía Aplicada, Universidad Autónoma de Barcelona, UAB (Spain).

The Food-fit Project. The general aim of the Food-fit project is to develop, from the point of view of the labour market, a methodology and a group of tools for the implementation and development of the European Qualifications Framework (EQF) in the food sector in the EU (NACE codes 10, 11: Manufacture of food products and beverages)¹.

The specific aims are the following:

- To analyse the key occupations for the food sector in the categories of high qualified workers (technicians), and then to describe the qualifications of those occupations in terms of learning outcomes: knowledge, skills and competences (EQF levels).
- To analyse those learning outcomes with reference to the European Higher Education Area and to the National Qualifications Frameworks (NQF).
- To develop a web site and computer tools for guidance, occupational training and promotion of the EQF in the food sector.
- To elaborate a dissemination guide addressed to the referent entities in the sector: public administrations, social partners, training centres and companies.
- To evaluate and spread the project outcomes, together with the referent entities in the sector: public administrations, social partners, training centres and companies.

Results:

¹ EUROSTAT (2005): *Nomenclature générale des activités économiques dans les Communautés Européennes (NACE CODES)*. http://ec.europa.eu/environment/emas/pdf/general/nacecodes_en.pdf

- An inventory of occupations in the food companies linked to the EQF descriptors.
- A web site which will facilitate the implementation and development of the European Qualifications Framework (EQF) in the sector.
- Experimental tools for professional guidance: application for the self-diagnosis, elaboration of CV (Europass), guidance on training itineraries.
- A guide for the implementation of EQF in the food sector, addressed to public administrations, social partners, training centres and companies of the sector.
- Presentation of national reports on the validation of the products.
- Report about the international dissemination seminar.

Presentation of the guide of the implementation of EQF in the food sector. The main objective of this guide is to inform public administrations, social partners, training centres and companies of the food sector on the need to define qualifications in the sector in terms of learning outcomes, according to the considerations of EQF. This guide presents the following contents:

- **FOOD SECTOR IN THE EU.** The food industry has similar characteristics and challenges in each of the European countries. In all cases, the future of the sector is linked to the qualifications of the employees, especially in areas such as: R&D, sales, environmental awareness, quality of production, optimization of processes, safety, etc.
- **LEARNING OUTCOMES IN THE EUROPEAN QUALIFICATION FRAMEWORK.** The European Qualifications Framework is an important challenge for the mobility of workers and the transparency of the labour market in the European Union. The learning outcomes represent an important tool to achieve the implementation of EQF.
- **NQFS AND THEIR CORRESPONDANCE WITH EQF.** The member states have experienced many difficulties in adapting their national and sectoral qualification framework to EQF. The situation of the National Qualification Framework is different and for the moment, Bulgaria, Germany and Spain have not achieved a NQF yet.
- **FOOD-FIT METHODOLOGY FOR THE DESCRIPTION OF LEARNING OUTCOMES.** After an exhaustive investigation in the participant countries, the Food-fit project has defined a methodology in order to identify and describe the qualification of food sector high qualified workers in the field of EQF, using the reference of learning outcomes and a common point of view about knowledge, skills and competences, based on the labour market.
- **INVENTORY OF OCCUPATIONS, FUNCTIONAL AREAS AND LEARNING OUTCOMES.** The main result of applying the methodology is an inventory with 30 relevant occupations in this sector, described in terms of learning outcomes. The learning outcomes take into account formal, non formal and informal learning, as a requirement of the labour market. The inventory allows us to create a web-site for the implementation of EQF in the sector.
- **EDUCATIONAL AND TRAINING OFFER FOR HIGH QUALIFIED WORKERS.** Formal learning is a very important resource for the qualification in the food sector. The training offer presents different structures in the field of Higher education and vocational education and training (VET) in the participant countries.

At the end of the report, the reader can find an example of European CV Europass (Appendix 2) elaborated with food-fit tools and an example of self-evaluation of qualification (Appendix 3). Both examples have been extracted from the tools designed in the Food-fit Project.

IMPORTANT NOTICE

The Food-fit project analyses professional qualification from the labour market and employment system perspectives, within the concept of Lifelong Learning, understood as “all learning activity undertaken throughout life, which results in improving knowledge, know-how, skills, competences and/or qualifications for personal, social and/or professional reasons (Cedefop, 2010)².

In this sense, the term “technician” is used in this document in reference to the highest levels of qualification required by the labour market in the food industry, and therefore, this term is not related to any specific educative official certification, but rather with the necessary qualification level for the food sector.

Thus, the term “technician” is identified with “a worker with a high level of professional qualification, required by the employment system”.

2. FOOD SECTOR IN THE EUROPEAN UNION

The food industry sector is **one of the largest and most important manufacturing sectors in Europe**. It is the second largest (after metal) in the manufacturing industry, with 14.5% of total manufacturing turnover (€917bn for the EU-27).

The employment in the food industry represents about 14% of the total manufacturing sector with 4.3 million employees. The agro-food industry represents 2% of Europe's GDP and 13.5% of total employment in the EU's manufacturing sector. It consists of approximately 310 000 enterprises, including some global leaders. It continues to play a fundamental role in satisfying the needs of consumers and contributes an **annual production of more than € 600 billion to the EU economy**. However, the entire European food supply chain has entered a period of adjustment. Consumer preferences are changing as a result of income and lifestyle developments as well as shifts in population. Customer concerns about food safety, health and prices have also imposed stringent requirements on the sector³.

Europe's cultural diversity and its deeply rooted food traditions are the foundation of the European Union (EU) food and drink industry and a key asset for further industry development. To maintain its position and improve its share on world markets, the industry requires greater use of technical know-how and a considerable strengthening of its capacity for innovation. It is of fundamental importance for the European Union to be an attractive location for continued industry investments, rather than pushing industry to take advantage of trade agreements and relocate offices outside the EU to supply the EU and other markets. In order to remain competitive in the global market, the European food and drink sector must preserve and improve its competitive advantage. This requires addressing problems of specific concern to the food and drink industries that are further addressed in the European Confederation of Food and Drink Industries (CIAA) Benchmarking Report: knowledge industry, R&D and innovation, agricultural inputs, trade policy and export performance, administrative burden.

Main characteristics. The food and drink industry is a pillar of the EU economy. With 14% of the total turnover of the manufacturing industries, 13% of the total value added and 14% of the total employees in the manufacturing sector (first European employer).

² CEDEFOP (2010): *Terminology of European education and training policy a selection of 100 key terms*.
<http://www.cedefop.europa.eu>

³ http://ec.europa.eu/enterprise/sectors/food/eu-market/index_en.htm

- The food and drink sector has a **leading position** at national level. In several EU Member States, the food and drink sector features in the top 3 manufacturing activities in terms of turnover. Moreover, in at least 10 countries, it is ranked first. France, Germany, the UK, Italy and Spain are the leading producers of food and drinks in the EU, accounting for more than 70% of the total EU turnover.
- **A leading employer:** The food supply chain accounts for 12% of EU employment. The European agro-food and beverages industry employs around 4.3 million persons, accounting for 1.7% of total employment in the EU in 2007. The European distribution sectors employ over 26 million people or 13% of total EU employment, with the wholesale trade sector accounting for 4.4% and the retail sector 8.5% of total employment. More than a third of them (3% of all employees) are active in the food retail sector⁴.
- The sector is characterised by a **modest but stable growth**. In 2004, the food and drink industry turnover reached 815 billion euros. A raising trend has been observed over the past 10 years. During this period the food and drink industry experienced indeed a 1.8% average growth per annum. To the opposite a trend towards a reduction of the workforce was confirmed within the last years with a 4.9% drop in the number of employees. Currently the food and drink industry employs 4.3 million workers in over 280.000 companies.
- **A significant contributor to trade:** Europe is the largest exporter as well as importer of food and drink products, with a positive trade balance (€3.7 billion in 2006⁵) excluding intra-community trade. France and the Netherlands are the largest EU exporters, while the UK, Germany, Italy and Spain are the largest importers. As regards the export prices, EU and selected Member States have prices above the world average, a fact that may indicate a relatively high added value, as well as possibly more expensive raw materials in some cases. The USA remains the main market for EU products.
- **A high fragmentation** exists across the sector. The F&D industry is composed of a diverse range of enterprises, from SMEs (small and medium enterprises) to large companies. However 99.1% of the food and drink companies are SMEs. These 280,000 SMEs employ 63% of food and drink workers and generate 48.5% of the turnover of the sector. On the other hand, larger companies account for only 0.9% of all food and drink companies, but they provide 51.5% of the turnover, 52.9% of the added value and contribute to 37% of the employment. Therefore, large companies account by far for the largest share of turnover and employment⁶.
- **Diversity** is the main asset of the EU food and drink industry. The food and drink sector produces a wide range of foodstuffs. Four distinct sectors of activity stand out from the numerous others: beverages, dairy, meat processing industries and various food products. They represent 69% of the total turnover and more than 80% of the total number of employees.

⁴http://ec.europa.eu/enterprise/sectors/food/files/high_level_group_2008/documents_hlg/final_report_hlg_17_03_09_en.pdf

⁵ Data & Trends of the European Food and Drink Industry 2007, CIAA.

⁶ Competitiveness of the European Food Industry: An economic and legal assessment. LEI, 2007.

Sub-sector	%
Meat	22%
Beverage Industry	16%
Grain based, Starch and further processed products	16%
Dairy Products	15%
Sugar and sugar based products	8%
Processed Fruits and Vegetables	7%
Oils and Fats	5%
Fish and Seafood	3%
Balance	8%

- **EU labour productivity is lower** compared to other European industries. Labour productivity in the European food and drink industry is considerably lower than in most other industries.
- The profitability of European food and drink processors is not increasing sufficiently to remain competitive in the long run: **SMEs are particularly vulnerable** in economic downturns. **Large companies make a higher profit** on their goods sold. This means that large food and drink companies in the EU can spend more on other business operations such as R&D and marketing. The pressure on gross profit margins for small, medium and large companies reflects an increase in production costs that cannot be passed on to consumers in the form of higher prices. If this trend persists in the future, problems regarding the bottom line will occur.
- **An increasing importance of the retail sector:** The distribution sector, in particular retail, is the principal outlet for food products, and being the final link in the supply chain, interacts directly with the final consumers. The retail sector is increasingly characterised by large food retailers and cross-border retail chains. Following a period of consolidation, the current degree of concentration in the EU food retail sector seems relatively high: in most Member States the five largest retailers' chains account for over 50% of the market⁷. The degree of concentration is higher in the old Member States, but the consolidation is more pronounced in the new Member States. In many of the old Member States this consolidation has been accompanied by a switch from smaller to larger store formats and an overall reduction in the number of stores. In contrast the number of individual stores in most new Member States has increased. In all Member States with the exception of Sweden food retail space has increased as has the number of large retail stores (i.e. hypermarkets, supermarkets and discounters).
- **A need to improve R&D efforts:** The research and development of innovative products and production processes are important for the entire food supply chain and aim at satisfying the ongoing changes in consumer preferences while ensuring product diversification. Furthermore R&D also increases both the efficiency and productivity of the sector through technological progress. Nevertheless the level of R&D investments at 0.24% of the total output of EU15 in 2003⁸, is considered to be low and there are clearly further opportunities to be exploited.

⁷ "The functioning of the food supply chain and its effects on food prices", SEC(2008)2972.

⁸ Ibid.

- A further major concern is the **availability of appropriate and qualified personnel** responding to the industry requirements, is of paramount importance for any industrial sector. Stakeholders stress that there is a lack of skilled personnel in the food supply chain sector, such as food scientists, technologists and engineers. With the expected demographic trends, the attraction of young workers into industrial production becomes a challenge for many industries. This is also the case for the food and drink sector which needs to improve its image and its attractiveness to young workers and students.

2.1. Food sector in Bulgaria

Bulgaria is a traditional agricultural country but the food sector is not a main economic activity. It contributes to 2.6% of Gross Added Value, 3.5% of employment and 15% of the total industrial production. In the food sector, there are around 6.500 SMEs, mainly in the production of bread and bakery, beverages, meat and dairy products. The food industry creates jobs for about 14% out of the all employees in the whole manufacturing sector and this percentage has remained stable during the past 5 years.

The four main sub-sectors (highlighted above) are the most important ones in the Bulgarian food industry.

The weaknesses concerning the food and beverage industry as a whole are the following:

- Lack of planning – which can often result in deficit or extra-production.
However, two funding programmes (part of Bulgaria Structural funds) – “Development of Human Resources in SMEs” and “Increasing the Competition of Bulgarian SMEs” have already been operational for three years whose main objective is to enhance SMEs’ resources in order to enable them to better plan.
- Lack of young professionals – which turns to be a very serious problem for most of the sub-sectors of the food industry and could be explained by the low social prestige and very low profitability of those professions.
- Low qualified personnel – the number of less skilled personal is 76% which could be explained by the fact that generally, employers are interested more by skills and labour experience of the hired personnel than by diplomas and certificates.

Country	Principal characteristics of the food industry	Challenges to be faced
Bulgaria	<ul style="list-style-type: none"> • Low importance of the food industry. • Importance of low qualified workers (76%). • Low wages. • Stability of the employment. • Higher importance of experience than degrees. 	<ul style="list-style-type: none"> • To reach full compliance with European regulations for food safety and quality control. • To meet European standards of production. • To improve organisation and planning. • To train both employers and employees. • To attract qualified workers. • To attract young workers. • To increase SMEs’ organisation and competitiveness.

2.2. Food sector in France

In France, agro-food industry has a paramount economic weight because of its central position in the food chain. French agro-food industry employs more than 400 000 people and as first world exporter of manufactured food products, its impact is both national and global.

Its specific identity differs from other industries because of the importance of the seasonal work, the small size of companies, the localization in rural areas, and the homogeneous dispersion on the French territory.

If each sub-sector entails specific strategic environmental and production processes, main changes regarding agro-food industries are common to the whole sector. Previously seen as an unattractive sector offering rough low qualified occupations, the agro-food industry is now looking for high skilled workers in different function areas going from sales to R&D department.

The agro-food sector has undergone major changes in recent years, and some of the most important ones concern the optimisation of processes (increase of robotic, detection of critical steps in terms of risks, energy use, speed or complexity of maintenance), the environmental awareness (energy saving, waste control and reduction, pollution analysis), the nutritional aspect (in order to fight against obesity), the quality improvement (operators involved, IFS certification) and the retail chains (in order to find out different paths of distribution for the SMEs).

Country	Principal characteristics of the food industry	Challenges to be faced
France	<ul style="list-style-type: none"> • High importance of the food industry (first European producer). • High importance of seasonal work. • Localisation in rural areas. • High proportion of SMEs (90%) • Concentration. • Stable global employment rate but high heterogeneities. • Positive trade balance: first world exporter. • Increasing importance of distributors' brands with 70% of the production made by SMEs. 	<ul style="list-style-type: none"> • To attract high skilled workers in all departments in order to increase performance but also to cope with the high number of retirements in the next 5 years. • To go on improving quality control, optimisation of processes, environmental efficiency, nutritional aspects. • To cope with increasing power of retailers.

2.3. Food sector in Germany

The German food processing industry has grown steadily over the past five years with a compounded annual growth rate of two per cent.

The import has a value of 38.7 billion euros and exports generated 36.3 billion euros in sales in 2007. Around 80 % of all exports are to other EU member states. On the production side, 93 % of the enterprises in the food industry have less than 250 employees and the average number of employees per company was 89 employees in 2006.

The food industry was less affected by the economic crisis than other industries. The turnover has indeed slightly increased. 80 % of the turnover is made by the five largest commercial enterprises in the industry. This results in a greater cost pressure on the producing industry. Restructuring and mergers are the consequences. At present, the large discount chains increasingly establish their own production capacities.

The proportion of unskilled and semi-skilled workers in the food industry has decreased because of the increasing mechanization. The food industry has to face large structural challenges such as a weak domestic demand, a strong competition, an increasing concentration and a regulation of claims.

Country	Principal characteristics of the food industry	Challenges to be faced
Germany	<ul style="list-style-type: none"> • High importance of the food industry (2nd European producer). • High growth of the sector in the past 5 years. • High concentration (5 companies make 80% of the turnover). • High proportion of SMEs (93%) • Global decrease of low qualified workers (high mechanisation) but heterogeneities. • Decreasing demand. • Negative trade balance • High power of the discount chains (establishing their own production capacities). 	<ul style="list-style-type: none"> • To go on complying with internationalisation (English as working language). • To cope with increasing concentration. • To deal with regulation of claims. • To attract high qualified workers in all departments. • To go on improving quality control, optimisation of processes to comply with high quality standards.

2.4. Food sector in Ireland

The food and beverage sector is the largest indigenous sector in Ireland (8% of GDP and over 18 % of GVA in manufacturing). In 2008, the industry employed directly 50,000 people, with a further 60,000 indirect employees and some 120,000 farmers.

The sector faces challenges related to the skill aspects in a number of areas such as international trade, upskilling operatives, supply chain management, innovation, lean operations, commercial acumen and leadership.

In 2008, Irish agri-food and drink exports declined of almost 7%. The UK was the main destination for Irish agri-food and drink exports in 2008 accounting for 45% of all exports; 32% of exports went to Continental EU markets while the remaining 23% went to international markets. In 2008, the main exports by sectors were dairy products and ingredients (28%), prepared foods (18%), beef (21%) and beverages (15%).

Country	Principal characteristics of the food industry	Challenges to be faced
Ireland	<ul style="list-style-type: none"> • High importance of the food industry (8% of GDP; 18% of GDA). • Decrease of exportations in the last years. • Decrease of low qualified workers (62%). • High costs of productions. • High power of retailers. 	<ul style="list-style-type: none"> • To cope with globalisation. • To cope with increasing power of the retailers. • To attract high skilled workers in all departments. • To train workers in order to up-date their skills. • To develop export markets by emphasising on sales, marketing and customer services. • To go on improving quality control, optimisation of processes, environmental efficiency, nutritional aspects and legislation.

2.5. Food sector in Spain

The food and beverages sector is the first in the Spanish manufacturing industry (16.38% of total industrial production) and represents around 3% of total occupation in the country.

Weaknesses	Strengths
<ul style="list-style-type: none"> • The atomisation of the sector and its small corporate dimension: 96% of companies are SMEs. • Rural location of the companies: 52% of establishments are located in municipalities which have fewer than 10,000 inhabitants. • Poor qualification of employees: difficulties to face new challenges, particularly in smaller companies. • Low productivity and competitiveness: lower than those of industry as a whole. 	<ul style="list-style-type: none"> • Less vulnerability to crisis situations as the demand for food products is relatively static. • Demand for more labour than industry in general thus the food sector is seen as an employment-generating activity. • Importance of exports: it is the second Spanish sector in terms of export volume and has a positive trade balance. • Potential economic development: major role in the socio-economic development of the country.

The challenges to be faced by the food sector in Spain concern the growing internationalisation of companies, the changes in consumer habits, the concentration of the various distribution processes for the products manufactured, the respect for the environment, the innovation in processes and the continuous technological changes.

Country	Principal characteristics of the food industry	Challenges to be faced
Spain	<ul style="list-style-type: none"> • High importance of the food industry (2nd manufacturing industry) (5th European producer). • High atomisation (96% of SMEs) • High proportion of low qualified workers. • Localisation in rural areas. • Stable demand. • Positive trade balance. • Absence of requirements for working in the field. • Employment in progression but unemployment too due to immigration. • Lack of training and organisation of SMEs. 	<ul style="list-style-type: none"> • To cope with growing internationalisation. • To go on improving quality control, optimisation of processes, environmental efficiency, nutritional aspects. • To increase SMEs' competitiveness. • To attract high qualified workers in all departments.

2.6. Comparative situation

Out of the five countries considered in this project, two groups can be made: on one side, countries where the food industry plays an important role in the national economy (France, Germany, Spain, Ireland) and on the other side, Bulgaria, where the food industry is not a major economic activity for the country. Indeed, these countries are at a different stage of development: the first group is composed of developed countries while Bulgaria is still a rural country which started its industrial development later. While the first group has already implemented recent European changes in legislation (quality control, environmental concerns, nutritional concerns and claims) and is only trying to improve them and/or generalise their use, Bulgaria need more work in order to reach full compliance with the basic requirements of UE food legislation. For this purpose, both employers and employees need to be trained and to up-date their knowledge and their skills.

In the other countries, low qualified workers are disappearing as a consequence of increasing mechanisation and industries need to attract high qualified workers in all departments to face globalisation.

- France is European leader and the major challenges to be faced there are the increasing power of retailers and the growing concentration.
- Ireland and Germany have to face the requirements of internationalisation. Indeed, their indigenous demand is low and they need to export their production, thus they need full compliance with European legislation.
- Spain is at an intermediate position: even if it is the fifth European producer, the absence of requirements for working in the field is slowing down the adaptation of practices and companies, in particular SMEs, are lacking of organisation.

Characteristics and challenges of the food sector

Main characteristics of the food sector	Bulgaria	France	Germany	Ireland	Spain
Importance of the food industry	-	+	+	+	+
Proportion of low qualified workers	76%	50%	↓	62% ↓	high
Demand	-	-	stable	-	stable
Trade balance	-	+	-	-	+
Exportations	-	-	-	↓	-
Proportion of SMEs	-	90%	93%	-	96%
Concentration	-	✓	✓	-	
Localisation in rural areas	-	✓	-	-	✓
High costs of production	-	-	-	✓	-
Low wages	✓	-	-		-
Higher importance of experience	✓	-	-		-
High development of distributors' brands	-	✓	-	✓	-
High power of retailers	-	✓	-	✓	-
High power of discount chains	-	-	✓	-	-
Challenges to be faced	Bulgaria	France	Germany	Ireland	Spain
To go on improving quality control, optimisation of processes to comply with high quality standards	-	✓	✓	✓	✓
To go on improving environmental efficiency, nutritional aspects	-	✓	-	✓	✓
To go on improving legislation	✓	-	✓	-	-
To reach full compliance with European regulations for food safety, quality control and standards of production	✓	-	-	-	-
To cope with growing internationalisation	-	-	✓	✓	✓
To cope with increasing concentration		✓	✓	-	-
To increase SMEs' organisation and	✓	-	-	-	✓

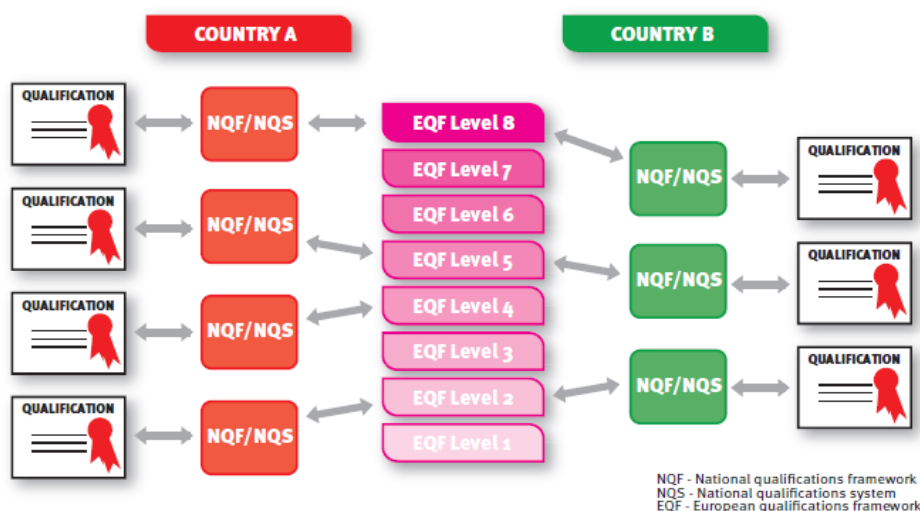
competitiveness					
To cope with increasing power of the retailers	-	✓	-	✓	-
To cope with increasing power of the discount chains	-	-	✓	-	-
To attract high qualified workers in all departments	✓	✓	✓	✓	✓
To train workers in order to up-date their skills	-	-	-	✓	-
To develop export markets by emphasising on sales, marketing and customer services	-	-	-	✓	-
To cope with the high number of retirements in the next 5 years	-	✓	-	-	-
To improve organisation and planning	✓		-	-	-
To train both employers and employees	✓		-	-	-
To attract young workers	✓	✓	-	-	-

3. LEARNING OUTCOMES IN THE EUROPEAN QUALIFICATIONS FRAMEWORK

The European Qualifications Framework⁹ (EQF) for permanent learning is a common reference framework created by the European Union which compares the qualifications systems of countries to improve the interpretation and understanding of the various European systems and qualifications. Its main objectives are to promote the mobility of citizens between different countries and facilitate access to permanent learning.

European Qualifications Framework. EQF

Figure 1: Referencing national qualifications frameworks or systems to the EQF.

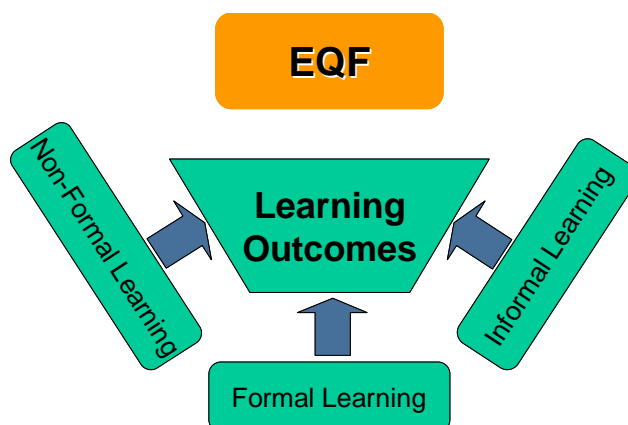


⁹ European Commission (2010): *The European Qualifications Framework (EQF)*. http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm

The European Qualifications Framework officially came into force on April 23rd 2008. It establishes 2010 as the recommended deadline for countries to carry out the correspondences between their national qualifications systems and the EQF, and 2012 for the individual qualification certificates to contain a reference at the corresponding level of the EQF.

The EQF describes the professional qualification by way of eight levels presented in terms of learning outcomes¹⁰ as “the expression of what someone knows, understands and is capable of doing upon completing the learning process; it is defined in terms of knowledge, skills and competences”. These learning outcomes may be acquired by formal, non-formal and informal learning, as well as by employment experience.

Ways of acquiring EQF qualification¹¹



3.1. European Qualifications Framework

The proposal for the European Qualifications Framework was launched by the European Commission in September 2006. This recommendation outlines an overarching framework to be set up in Europe to facilitate comparison of qualifications and qualifications levels in order to promote geographical and labour market mobility as well as lifelong learning. The core of the framework consists in 8 qualifications levels described through learning outcomes (knowledge, skills and competences) –see Appendix 1, EQF descriptors–.

Countries are invited to relate their national qualifications levels to the neutral reference established by the EQF. Following the adoption by the European Parliament and Council (December 2007), a process of implementation will start in 2008. Those countries deciding to go along with the EQF (it is a voluntary process) will be asked to do this in two stages. The first stage – referring national qualifications levels to the EQF – should be completed by 2010. The second – introducing a reference to the EQF in all new certificates – should be completed by 2012.

EQF: new perspectives, new approaches. The EQF represents a new approach to European cooperation in the field of qualifications. The introduction of a set of learning outcomes based reference levels/descriptors spanning all forms of qualifications and the entire range of qualifications levels have not been attempted previously. Successful implementation of the EQF therefore requires that everybody involved shares a clear understanding of:

¹⁰ See table in annex 2, at the end of the present document.

¹¹ See glossary at the end of this document.

- the objectives and main intended functions of the framework;
- the principles and logic applied when defining the framework (how were the descriptors constructed, how should they be read?);
- the requirements to implementation (in terms of stakeholder involvement, transparency, quality assurance and peer review).

Why the EQF is called a ‘Meta-framework’? The EQF has been designed to act as a reference for different qualifications systems and frameworks in Europe. It takes into account the diversity of national systems and facilitates the translation and comparison of qualifications between countries. In this sense the EQF is a framework for frameworks and/or systems and it can therefore be defined as a ‘Meta-framework’. (A qualifications framework can be seen as part of a qualifications system in which the levels of qualifications are explicitly described in a single hierarchy).

This meta-framework will enable qualifications systems with their implicit levels or/and national and sectoral qualifications frameworks to relate to each other. In the process of implementing the EQF it is intended that each country will reference its national qualifications (in terms of diplomas, certificates or awards) to the eight EQF levels via national qualifications frameworks or the implicit levels in the national qualifications systems. This means that in the first stage levels of national qualifications frameworks or parts of qualifications systems will be referred to the EQF levels. In the long run, all qualifications awarded in Europe should have a reference to the EQF.

What are the principles behind the EQF descriptors and what is the significance of their wording? The descriptors have been written to cover the full range of learning outcomes, irrespective of the learning or institutional context from basic education, through school and unskilled worker levels up to doctoral or senior professional levels. They cover both work and study situations, academic as well as vocational settings, and initial as well as continuing education or training, *i.e.* all forms of learning, formal, non-formal and informal.

In addition, the descriptors reflect both specialisations and generalisations. Thus, reaching a higher level does not necessarily imply that the required skills and knowledge will be more specialised, although this might be the case in many academic and research contexts. Moving from a lower to a higher level can also mean becoming more of a generalist in some study or work contexts.

The descriptors have been written to sufficiently distinguish between descriptors from the level below or the level above and show, from the previous level, distinct progress in dimensions of change. Each level builds on and subsumes the levels beneath. However, in order to keep the table and the text as clear as possible, repetitions are avoided and the descriptors of the respective previous levels are implicitly included. To achieve, at the same time, continuity, as well as discreteness, key words have been used to characterize levels (e.g. ‘factual and theoretical knowledge’, in contrast to ‘basic knowledge’ on the lower levels or ‘specialised knowledge’ on the higher levels; or ‘supervision’ of the work/study activities of others which come in at level 4 and 5, but are not relevant at levels below). These key words can also be understood as indicators of threshold levels. A full understanding of one particular level therefore requires a ‘horizontal as well as vertical reading’ where lower and higher levels are taken into account

Further criteria for formulating the descriptors were: to use only positive statements; to avoid jargon; to apply definite and concrete statements (e.g. avoiding terms like ‘appropriate’) and at the same time to be as simple and generic as possible. Thus, the descriptors of the present EQF table are deliberately rather generic, e.g. in comparison to previous versions. The column

titles were pragmatically chosen to use simple and comprehensible terms, instead of possibly more precise, technical terms used by a small group of experts.

3.2. Learning outcomes

What is meant by ‘Knowledge, Skills and Competence’ and why do we use these terms?

There are many different possibilities for structuring and constituting the results of learning processes.

Following discussions between technical experts from all countries involved in the development of the EQF, it was agreed to use the distinction between knowledge, skills and competence (KSC) as basis of the framework, because it is the most established way for categorizing learning outcomes.

Clearly, this categorization was inspired by and connected to other, very similar, differentiations in learning outcomes. In France, for example, one generally distinguishes between *savoir*, *savoir-faire* and *savoir-être*; in the German-speaking countries, the common differentiation is between *Fachkompetenz*, *Methodenkompetenz*, *Personalkompetenz* and *Sozialkompetenz*; while in the English-speaking countries, the conventional categorisation is between ‘cognitive competence’, ‘functional competence’ and ‘social competence’.

The EQF’s differentiation between knowledge, skills and competence can therefore be seen as a pragmatic agreement between the various, widespread approaches and does not oblige countries to do the same. National or sectoral frameworks or systems may require different approaches, taking into account specific traditions and needs.

The KSC differentiation of learning outcomes helps to clearly construct descriptors and to more easily classify the levels of qualifications. Nevertheless, these three categories (KSC) should not be read in isolation from each other, but they should be collectively perceived.

Thus, to grasp the characteristics of one level requires also ‘horizontal reading’. Similarities may exist between the categories (e.g. the column ‘competence’ includes certain skills; the column ‘skills’ also contains certain forms of knowledge) but this is in the nature of things.

Other qualifications frameworks use more or other categories or dimensions instead of knowledge, skills and competence. Are qualifications frameworks with other dimensions at all comparable? In national, regional or sectoral qualifications frameworks, descriptors can be adapted to their respective aims and objectives (e.g. country-specific or sector-specific needs). That’s why there is no general nor only one valid way to use descriptors; different ways are possible. The EQF was designed to have the fewest and simplest possible differentiations. The EQF can be seen as focussing on the most essential and substantial aspects. The interpretation of the EQF descriptors is made simpler because they take into account very similar descriptors in existing qualifications frameworks and because they enable making comparisons and relations.

Some say that the EQF ought not to be a qualifications framework, but a competences framework. Some even suggested that ‘competences’ would be the adequate umbrella term for the table. Is this right and what is meant? The EQF is a (meta-) qualifications framework and not a competences framework, because it enables the classification of qualifications levels and systems.

It is not intended to be used for the classification of individual competences. It is a learning-outcome orientated framework, in which the descriptors describe all forms of learning outcomes. The misunderstanding of the EQF as a competences framework is due to the fact

that learning outcomes are formulated as statements about what the learners can do and so provide a certain 'competence orientation'. The EQF is also, insofar, not a competences framework, as learning outcomes can, for example, also be knowledge without any corresponding competences or skills.

Learning outcomes are consequently always more comprehensive than competences and not the reverse. Hence, competences would not be the adequate umbrella term for the table. More correctly, the EQF should be called a 'qualifications framework based on learning outcomes'.

3.3. Best fit

Part of a national qualifications system seems to fit perfectly on a certain level in one of the three columns, but according to another dimension it would fit better on another level. Is it possible to relate one and the same group of qualifications to different levels? No, because the EQF is not a system to classify qualifications according to different dimensions. In other words, the EQF table should not be read as separate columns. To read one level means that the whole line (all three columns) must be read all the way across and, in addition, each level descriptor assumes inclusion of the outcomes for the levels below. Thus, a full understanding of a particular level requires that it should be read in relation to the preceding levels. Due to the nature of Europe's extensive qualifications systems and diverse qualifications, quite often, parts (a group of qualifications) of a national qualifications systems will fit into a certain level in one column, whereas at the same time they fit into another level of another column. There might be very different qualifications according to the complexity of knowledge or the range of skills required, but they can be just as difficult to achieve.

Presentation of the EQF descriptors in a table with three columns should facilitate understanding of the EQF and the assignment of qualifications. If the table format results in contradictory interpretations, the columns should be seen as of secondary importance. Consequently, this means, that one should simply read the whole line (knowledge, skills and competence) and judge – all in all – in which of the levels the group of qualifications fits best. This way of reading the descriptors will help to establish 'the centre of gravity' of the qualification in question and thus make it possible to decide where to place it in relation to the EQF. This illustrates that due to the diversity of qualifications at national and sector level there will never be a perfect or absolute fit to the EQF levels - the principle of best fit has to be applied instead.

Is one column of the descriptors table more important than the other? Existing qualifications will vary considerably as regards their focus on knowledge, skills or competence. E.g. academic qualifications might focus more on knowledge, whereas certain vocational qualifications might focus more on skills or competence. The three dimensions introduced in the EQF should help to identify these differences in the process of assigning qualifications. By no means the EQF intends to promote or to discriminate any type of qualification, but to act as neutral reference point for all different sorts of qualifications. An important objective underpinning the EQF is the promotion of parity of esteem between academic, vocational or higher education routes as well as between initial and further education. In this sense, all the dimensions of the table are of equal value.

A qualification may fit perfectly in a certain level in one of the columns, but according to the descriptors in another column, at first sight, may seem to fit better in another level. One could therefore – or simply because the column 'knowledge' comes before 'skills' – ask if a certain column has more importance than the others. This is not the case. All of the dimensions are equally important and the order of the columns is not meant to be of any particular consequence.

Does the EQF have to be seen as a ladder? Do all steps have to be taken to reach a qualification at a certain level? If yes, why is the ladder ending at the eighth step, since the EQF is a framework for lifelong learning? Can somebody also acquire qualifications on different levels or does only the highest one count? The EQF is a ladder in the sense that from level 1 to level 8 the associated learning becomes more complex and makes greater demands on the learner or worker. Increases in level 1 to 8 relate to different factors such as:

- the complexity and depth of knowledge and understanding;
- the degree of necessary support or instruction;
- the degree of integration, independence and creativity required;
- the range and complexity of application/practice;
- the degree of transparency and dynamics of situations.

This list certainly is not comprehensive, as learning has many relevant dimensions, some which we might not even know. It should only indicate what is meant by ‘increasingly greater demands on learners/workers’.

Understanding the EQF as a ladder with 8 steps does not mean that it is necessary to differentiate the same number of levels in all national contexts, fields, sectors or domains. National qualifications systems or frameworks might include more or less levels. In some fields, sectors or domains there might be no qualifications on a higher level available. In others there might be no qualifications at the lower levels existing or there might even be qualifications which go beyond the level 8. The EQF does not further differentiate between qualifications on level 8 and above.

The EQF is not an instrument for directly documenting individual learning progresses but to provide – in the first stage – a translation device between different national contexts and – on the long run – a reference tool for all qualifications issued in Europe. However, indicating EQF levels for qualifications does not mean that qualifications necessarily have to be acquired in the same sequence as the EQF levels. Over their lifetime, learners will primarily move from a lower to a higher level, but it is also possible to gain two different qualifications at the same level or to move from a higher to a lower level of qualification, if new learning is taken on and new skills are acquired.

Can the descriptors of the EQF also be used for National Qualifications Frameworks (NQF)? The purposes of qualifications frameworks vary according to their context (either international, national, regional or sectoral comparison); therefore, the specific design of the frameworks will also differ.

The EQF is designed as a meta-framework and consequently uses more generic descriptors than most national, regional or sectoral frameworks.

The EQF descriptors do not substitute for the descriptors of other qualifications frameworks. But obviously, the structure and number of levels of these other descriptors can be orientated towards the EQF. That means the EQF descriptors should not be used as a blueprint for the development of other frameworks without clearly considering and reflecting the respective needs. However, the EQF descriptors can be used as a starting point for this process and they can be changed, complemented etc. if appropriate.

Why are certain competences like key competences or meta-competences (e.g. awareness for sustainable development, learning to learn or ethical competences) not mentioned in the EQF? The EQF does not make any statements about the specific content of learning outcomes. What a country or society considers at the present or future as key competences (e.g. competence of foreign languages, communicative competence, entrepreneurial competence, cultural competence) might change between countries and

societies, but also changes over time. The EQF does not refer to any specific key competences, but can cover all different types of key competences at different levels.

There are also some other, more general, competences like 'learning to learn' or 'ethical competence', which have not been explicitly included in the EQF. These features, often referred to as meta-competences, have not been included because they cannot be seen independently from other knowledge, skills and competence. Thus, they have not been added as an additional dimension, but should be seen as an integral part of knowledge, skills and competence. For example, learning to learn plays an important role for gaining theoretical and factual knowledge; ethical competence is important for the development of autonomy and responsibility.

3.4. Higher Education and VET

Can the EQF be used for classifying educational programmes and occupations? The EQF was not designed to classify educational programmes or occupations, but instead focuses on qualifications systems and frameworks. The EQF levels do not reflect participation in any particular education programmes or competences required for particular tasks or occupations. Of course, qualifications are related to education and training and to the occupational world and these elements are very important in the EQF. ISCED (International Standard Classification of Education) and ISCO (International Standard Classification of Occupations) are classifications specifically designed to classify education and occupations. The EQF only partially implies a hierarchy of educational programmes (e.g. a qualification on a higher level in the EQF very likely will correspond to a higher level on the ISCED levels) and a hierarchy of occupations (e.g. a qualification on a lower EQF level will very likely lead to an occupational activity ranked on a lower level in the ISCO skill levels).

However, the EQF focuses on learning outcomes in the form of knowledge, skills and competence; these are seen autonomously of education programmes or occupational contexts. The EQF thus constitutes a new instrument, which offers the possibility to combine educational and occupational taxonomies and, in a way, bridges ISCED and ISCO.

What is the relationship between the EQF and the framework for the European Higher Education Area? At the European level, the development of qualifications frameworks began with a qualifications framework for one education sector: The Framework for Qualifications of the European Higher Education Area (QF-EHEA) has been formed since 1999 (Bologna Declaration; the Dublin descriptors were adopted in 2005¹²); whereas, the development of the EQF started in 2005. The two frameworks clearly have similarities and overlapping areas: both are meta-frameworks, cover a broad scope of learning and are designed to improve transparency with regard to qualifications within Europe. They are both associated with quality assurance and use the concept of 'best fit' to determine levels. Both also have clear aspirations to support lifelong learning and labour mobility.

Despite these obvious similarities between the two frameworks, differences can also be observed with regard to their aims and the descriptors used. The QF-EHEA intends to harmonise systems whereas the EQF intends to relate systems to each other.

One central objective of the Bologna process is to harmonise the European higher education systems by introducing common degree structures (three-cycle degree system). The EQF, on the other hand, is not an instrument for harmonising qualifications or parts of qualifications

¹² Joint Quality Initiative Informal Group (2004): *Understanding Dublin Descriptors and EQF descriptors. Descriptors of Learning outcomes, understanding and use* JQI meeting (Leiden, october 2006).

systems but it is intended to function as a type of translation device to make relationships between qualifications and different systems clearer.

To link these two meta-frameworks, the EQF document asserts compatibility with the QF-EHEA. A main reason for drawing the higher levels of the EQF directly on the EHEA descriptors is to avoid the development of two isolated frameworks. Thus, the learning outcomes of certain EQF levels correspond to the cycle descriptors of the QF-EHEA. There is a clear cross-referencing at levels 5 to 8. Thus, the QF-EHEA's respective cycle descriptors – developed by the Joint Quality Initiative, as part of the Bologna process – are understood to be compatible with the descriptors for levels 5 to 8 of the EQF. Although different descriptors are used, both frameworks have a common view of the dimensions of progression regarding knowledge, skills (application) and professional conduct.

However, since the EQF is an overarching framework and seeks to include different forms of learning (not only learning in higher education but also more professional oriented qualifications), the descriptors are broader, more generic and have to be more encompassing than the Dublin descriptors applied to define the levels for the QF-EHEA. This means that the levels can be seen as equivalent, although the level descriptors are not the same. Consequently, EQF levels 5 to 8 can be compatible not only with qualification degrees acquired in formal way by studying in a higher education institution, but also with vocational qualifications awarded through formal, non-formal or informal learning.

In the QF-EHEA, learning outcomes are understood as descriptions of what a learner is expected to know, to understand and to do at the end of the respective cycle. The Dublin descriptors refer to the following five dimensions: 'knowledge and understanding', 'applying knowledge and understanding', 'making judgements', 'communication' and 'learning skills'. Whereas the first three dimensions are mainly covered by the knowledge and skills dimensions in the EQF, the EQF does not explicitly refer to key competences such as communication, or meta-competences, such as learning to learn. These are partly included in an inherent manner in all the columns, but can mainly be assumed in the competence column.

Although the descriptors defining levels in the EQF and the Dublin descriptors differ, the EQF level descriptors fully integrate the Bologna descriptors and are thus compatible to these.

4. NATIONAL QUALIFICATIONS FRAMEWORKS (NQFS) AND THEIR CORRESPONDANCE WITH EQF

4.1. NQFS: development and implementation trends in Europe

Unifying different national conceptions of professional qualification into one single reference tool has been an open topic in Europe over the last ten years. The system of transfer of credits, the programme for life-long training and the Bologna conversion are just instruments in the reform process of the education and qualification systems in Europe. The main objective of this process is to make all education systems clearer and easier to understand by describing them in terms of the same learning outcomes, which means the same expected results.

Our research on National frameworks in the five participating countries in the Food-fit project showed that the process of establishment of National Qualification Systems (NQF) has been quite intensive within the last 5 years. They all show a political interest to achieve the European objective for the implementation of qualification frameworks and recognise that the establishment of a NQF that refers to the European one promotes mobility within educational systems and labour markets, foster cooperation between stakeholders and finally increases transparency in the State qualification systems. Through the EQF, the professional

qualification of high qualified workers is already organised in a common device which “translates” and compares qualifications in Europe. This will enable high qualified workers from all European countries, first to get a clearing understanding of their qualification level and second, to know how they can have their qualification level recognised in other European countries.

Out of the 5 Food-fit project participants, only 2 countries have already implemented overarching NQF (Ireland and France), *i.e.* combining lower and higher levels of qualifications. Currently, those two countries are modifying their systems in order for the latter to become comparable to the EQF. This will be finalised by the end of 2011. In the other countries - Bulgaria, Germany and Spain - only NQF for professional qualifications for high qualified workers have been introduced (for Higher Education). Those systems are, for now, not linked to lower qualifications and are not separated by economical sectors. Therefore, the biggest effort everywhere is to combine, at national level, all existing frameworks into a device which will be comparable with the European one.

In the table below are presented the correspondences between the NQF levels currently defined in each country and the EQF levels. In bold are highlighted the levels obtained with at least a Bachelor degree which therefore correspond to the professional qualification of high qualified workers.

Correspondences between the NQF levels

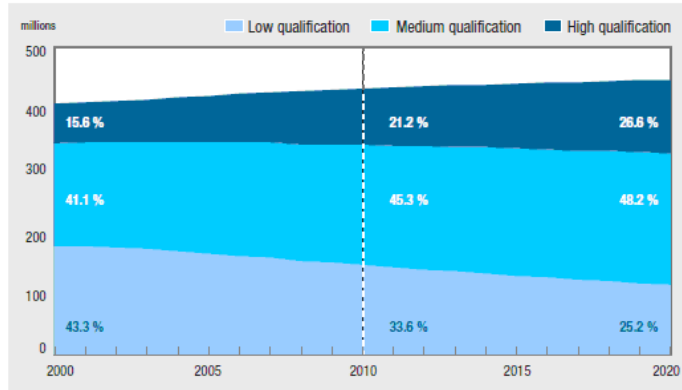
EQF	Bulgaria	France	Germany	Ireland	Spain
1	-	-	1	1,2	-
2	1	V	2	3	1
3	2	V	3	4	2
4	3	IV	4	5	2
5	4	III	5	6	3
6	5	II	6	7,8	4
7	6	I	7	9	5
8	7,8	I	8	10	-

The increasing importance of high qualified workers in the labour market in Europe. Europe must focus more on skills than ever before. Skills to adapt and to shape the jobs of tomorrow are essential for Europe’s citizens and businesses to speed up economic recovery. Europe not only needs to step up investment in education and training, but also encourage employers to use better the skills and talents of their staff.

According to Cedefop studies, in the EU, the **biggest increases in employment levels will be registered in high-level managerial and technical jobs**: legislators, senior officials and managers (net creation of +1.4 million jobs), professionals (+2.7 millions) and high qualified workers and associate professionals (+4.5 millions). A substantial rise in the number of adults in the labour force with a high level of education (**ISCED 5 and 6**) is predicted: **more than 20 millions** for the EU-25, equivalent to a 40% increase between 2007 and 2020.

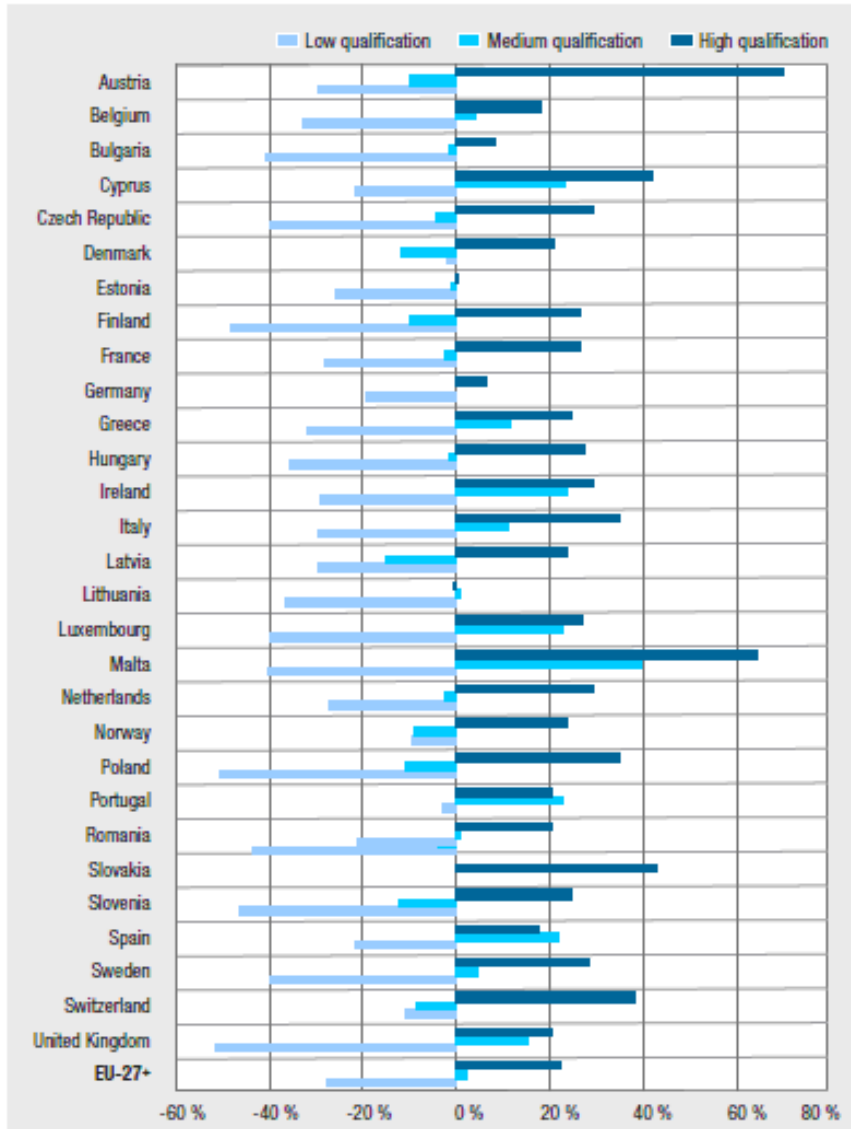
FOOD-FIT PROJECT

Trends in population (15+) by qualification, EU-27*



Source: Cedefop (IER estimates from StockMOD).

Projected change (in %) in labour force by qualification and country, 2010-20



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¹³ http://www.cedefop.europa.eu/EN/Files/3052_en.pdf, page 48.

4.2. Specific situation in Food-fit project participating countries

National Qualification Framework in Bulgaria

Bulgaria is currently developing an overarching National Qualifications System (**NQF**), based on learning outcomes that will include all levels of education and qualification, as well as their corresponding qualification degrees in EQF. Today, many laws, acts and articles describe the operating system and there is no official combined document presenting the reference with the EQF and the learning outcomes for each qualification.

A serious problem for the establishment of the NQF is that **the actual system is not organised by sectors or NACE codes** and the levels are the same for all productions. However, Bulgaria has taken an official engagement to create and introduce a NQF, by the end of 2011.

The qualifications in Bulgaria, in the NQF are organised in 8 levels taking into account the specific features of the national education system and ISCED 97. The first level of the EQF does not exist in the Bulgarian one; therefore, the first Bulgarian level is equal to the second EQF one. The higher levels of qualification (the professional qualifications of high qualified workers) can only be obtained through formal education. All levels in the NQF draft are described in terms of knowledge, skills and competences.

Here is a correspondence table for higher positions in the food sector in Bulgaria:

Number of years of study	Degree obtained	ISCED level	NQF level	EQF level
3	Professional Bachelor	5B	4	5
4	Bachelor	5A	5	6
5	Master	5A	6	7
8	Doctor	6	7,8	8

Qualification level	Level definition
Specialist / Professional Bachelor	<ul style="list-style-type: none"> – Theoretical knowledge and practical training in their professional field.
Bachelor	<ul style="list-style-type: none"> – General view on the character on the professional field and the specialisation. – Wide theoretical and practical training. – Acquired skills for individual and analytical work, work in a team and adaptability to changing situations.
Master	<ul style="list-style-type: none"> – Detailed theoretical training. – Additional S&T specialised training. – Additional interdisciplinary approach to the professional field. – Awareness of main research activity in the field. – Adaptability to social, economical and technical changes.
Doctor	<ul style="list-style-type: none"> – Knowledge with the more advanced frontier of a specific working field and interdisciplinary approach to interconnection between different fields. – Skills and more advanced and specialised techniques, particularly in the field of needed synthesis and valuation to solve critical problems of researching and/or innovation to redefine knowledge and existing professional practices. – Authority, innovation, autonomy, academic and professional integrity and continuous engagement.

National Qualification Framework in France

The setting up of an overarching NQF in France started in 2002 and is expected to be finalised in the end of 2010. This process was supported by the establishment of a register of professional certificates and as system for validation of non-formal and informal learning.

The actual framework for professional profiles exists from 1969 and comprises 5 levels that are described in terms of expected acquired knowledge, skills and competences. However in France, a strong focus on skills could be observed. Recent policy initiatives emphasized the need to reformulate the education requirements and clarify their qualifications also in terms of labour market relevance because syndicates and stakeholders in the educational sector declared that many students cannot find related jobs to their profile after finishing universities.

The category “technician” in France comprises employees with a degree obtained at least two years after the Baccalaureate. The lowest level in the actual French NQF for technicians matches with an EQF level 5 as we can observe in the following table:

NQF Level	Definition	Indication
III	Jobs that normally require a level of training equivalent to Academic Diploma of Technology (DUT) or higher technical certificate (BTS) or end of undergraduate higher education.	A Qualification Level III corresponds to a high knowledge and skills level without involving the mastery of the foundations of scientific fields. The skills and knowledge required allow working in an autonomous or independent way in design activities and / or supervision and / or management.
II	Staff in jobs normally requiring training to a level comparable to Academic License.	This level involves the scientific underpinnings of the profession, generally leading to autonomy in the exercise of this activity.
I	Staff in jobs normally requiring a training comparable to Academic Master's degree, Engineer degree or PhD.	In addition to knowledge of the scientific basis, qualification level I requires the mastery of process design or research.

Correlation between the EQF, the French NQF and the ISCED

National Qualification System	ISCED	EQF	NQF
Doctorat	Level 6 – Third stage of tertiary education (leading to an advanced research qualification).	8	I
Master, Ingénieur	Level 5A. Second stage of tertiary education programmes	7	
Licence	Level 5B. First stage of tertiary education programmes is practically oriented/occupationally.	6	II
BTS, BTSA, DUT		5	III
Baccalauréat (upper secondary level certificate)	Level 3 – Upper secondary education High School.	3,4	IV
BEP, CAP	Level 2. Lower secondary or second stage of basic education.	2	V

For levels III, II and I, several diploma and certificates are specifically dedicated to the agro-food industry.

National Qualification Framework in Germany

The German Qualification Framework (GQF) is now only available for high qualification levels. These are described in terms of professional and personal competences. An overarching system is currently being developed in order to mirror the European Qualifications Framework and to contribute to an appropriate validation and comparability of German qualifications in Europe. Following the preliminary work for the establishment of an overarching system, a pilot sectoral system was introduced as a test in the following sector: IT, metal, health and trade.

Once this NQF is established, each diploma or certificate issued in Germany will refer to the corresponding EQF level. To begin with, all formal qualifications of the German education system of the areas school, vocational education, higher education and further education are factored in. In future steps the results of informal learning should be factored in as well.

All actors participating in the development mutually agreed on not replacing the existing system for professional qualifications of technicians with aligning qualifications of the German education system to the reference levels of the GQF. Each qualification level should continue to be accessible through different courses of education. Achieving a particular reference level of the GQF does not automatically entitle to access the next level. Furthermore the achievement of a reference level should not be connected to salary or tariff issues.

The main difference between the GQF and the EQF will be structural because the GQF is introducing a difference in the learning outcomes. The draft GQF differentiates between two categories of competence: “Professional competence” and “Personal competence”. The Professional competence is subdivided into knowledge and skills. The Personal competence is subdivided into social competence and self-competence. According to this holistic concept of competence, competence consists of knowledge, skills, social and self-competence. The EQF considers competence as an equal category among knowledge and skills. But it has not been clarified which category is crucial in aligning qualifications.

The effects of categorical differences of the GQF and the EQF will become apparent by the end of 2012 when every qualification is aligned to the EQF. The qualifications are not aligned directly to the EQF but rather through their respective national qualifications framework. And the German Qualifications Framework already differentiates in structure from the European.

The reference levels 6 and 7 of the draft GQF are the ones included within the Food-fit target.

National Qualification Framework in Ireland

The overarching Irish Qualification Framework was launched in 2003 and was the first European country that has respected the EC deadline for reference with the EQF. The referencing with the EQF was completed in June 2009.

The Irish Education System was traditionally divided into three basis levels: Primary (8 years), Secondary (5 or 6 years) and Higher Education which offers a wide range of opportunities from post-secondary courses, to vocational and technical training, to full degree and the highest post-graduate levels. In recent years the focus has expanded to include pre-school education and adult and further education as the concept of lifelong learning becomes reflected in the education opportunities available within the Irish education system.

The Irish NQF includes 10 levels that capture all stages of education – from initial to the most advanced. Systems for credit transfer and recognition of non-formal learning for lower and high levels of qualifications are also pursued and cooperation with stakeholders in education and training is being strengthened. The 10 levels are based on national standards and are described in terms of knowledge, skills and competences. The difference with the EQF is that

competence is divided into context, role, learning to learn and insight. But knowledge, skills and competences are considered as expected learning outcomes by National Authorities.

The industry recognises the need for skilled personnel and has invested significantly in the recruitment process. Increasingly, companies are choosing to use a recruitment centre approach and are deploying tools such as aptitude tests in their selection processes. This reflects the increased focus on product quality, continuous improvement, environmental requirements, legislation, increased reliability and customer service requirements.

National Qualification Framework in Spain

The National Qualifications Framework in Spain is carried out in accordance with the Spanish Qualifications Framework for Further Education (MECES) and the National Qualifications System (SNCFP) in accordance with Organic Law 5 enacted on June 19th 2002 of Qualifications and Professional Training. The full integration and referencing to the EQF will be finalized in 2011. The Spanish framework includes 5 levels that correspond to six levels in the European one, because the first and the eighth European levels do not have any corresponding level in Spain. The Spanish level 2 is situated between 3 and 4 to the EQF.

Higher Education in Spain: At present, in Spain, a progressive harmonisation is being carried out of the university systems required by the process to construct the European Space for Higher Education, commenced in 1999 with the Bologna Declaration and whose objective is expected to be obtained in 2010. One of the basic objectives of this reform is to promote and facilitate the mobility of students. University courses conducive to obtaining titles of an official nature and validity throughout national territory shall be structured into three cycles: Degree, Masters and Doctorate.

In 2002, the National Qualifications System (SNCFP) was created in Spain,¹⁴ which involved the organization of a full system for professional training, qualifications and accreditation to reply to the social and economic demands through the various training schemes.

The SNCFP is a basic reference for the development of the National Qualifications Framework, owing to the importance of the National Qualifications Catalogue as a reference for the PT titles (education system) and the professionalism certificates (Professional Training System for Employment), as well as for the evaluation, accreditation and recognition of qualifications in the country.

National Qualifications Catalogue (CNCP): The CNCP is the main instrument of the National Qualifications System to achieve the objectives proposed previously. This instrument serves to organise the professional qualifications capable of recognition and accreditation, identified in the production system in line with the appropriate competences for professional exercising.

It includes the most important professional qualifications of the Spanish production system organised into professional families and levels and constitutes the basis for drawing up the training offer of titles and professional certificates. The CNCP includes the content of the professional training associated with each qualification in accordance with a structure of coordinated training modules.

The National Qualifications Institute (INCUAL)¹⁵ is the technical instrument responsible for defining, drawing up and keeping up-to-date the CNCP and the corresponding Modular Professional Training Catalogue.

¹⁴ Organic Law 5 enacted on June 19th 2002 on Qualifications and Professional Training (LOCFP).

¹⁵ INCUAL. National Qualifications Institute. http://www.educacion.es/educa/incual/ice_incual.html

The CNCP is organised into 26 professional families and 5 qualification levels in accordance with the exact degree of knowledge, initiative, autonomy and responsibility to carry out said employment activity.

- Level 1. Competence in a reduced group of relatively simple working activities related to normalized processes, in which the theoretical knowledge and practical capacities involved are limited.
- Level 2. Competence in a group of well-determined professional activities with the capacity to use particular instruments and techniques concerning mainly an execution activity which can be autonomous within the limits of the above-mentioned techniques. It requires knowledge on the technical and scientific fundamentals of the activity concerned and capacity for the comprehension and the application of the process.
- Level 3. Competence in a group of professional activities which require the command of different techniques and can be executed in an autonomous way. It involves responsibility on the coordination and supervision of technical and specialized work. It demands the understanding of the technical and scientific fundamentals of the activities concerned as well as the assessment of the factors in the process and the assessment of the economic repercussions.
- Level 4. Competence in a wide group of complex professional activities performed in a great variety of contexts which require combining technical, scientific, economic or organizational variables to plan actions, or to define or develop projects, processes, products or services.
- Level 5. Competence in a wide group of professional activities of great complexity performed in different contexts, often unpredictable, which imply to plan actions or to conceive products, processes or services. Great personal autonomy. Frequent responsibility on the assignment of resources and on the analysis, diagnosis, design, planning, execution and assessment.

4.3. Sectoral approach of the frameworks

As mentioned previously, all the countries are making efforts to refer their qualification systems to the common European tool (EQF), especially in the field of the professional qualification of high qualified workers. Their main difficulties are linked with the fact that many separate national acts have to be combined into a common framework and that some differences are so important that the stakeholders in the education and training systems in those countries prefer to keep their existing systems, as illustrated in the German case for instance.

The sectoral approach of the frameworks is possible but requires prompt communication between all relevant stakeholders which is not an easy task for all countries, especially in Bulgaria where generally, transparency in the Ministry of Education (responsible institution for the NQF implementation) is lacking. However, all countries are interested in implementing a system of credit transferability and recognition of informal or non-formal learning since they recognise that this will foster the mobility of workers and the transparency of qualifications - final aim of the European Lisbon strategy. Following the information provided in the next table, we can conclude that professional technicians could be able to recognise their qualification in all 5 Food-fit countries in 2012 when all overarching NQF systems are available. The future situation in the agrifood industry for employees is difficult to anticipate now, as no defined deadlines in the EC countries have been set to establish sectoral qualification frameworks.

Specific situation in Food-fit project participating countries

Country	Scope of the framework	Stage of work	Number of levels	Description of levels	Reference to the EQF
Bulgaria	Frameworks for HE and professional education were drafted separately Overarching NQF will include all levels of education and training	Initial stage/ design and conceptualisation Expected to be introduced by the end of 2011	8 levels	Levels will be described in terms of: - Knowledge - Skills - Competences Based on EQF, ISCED 97 and the national education system	The NQF will refer to the EQF. The first NQF level will be equal to the second EQF one
France	Qualification profiles implemented in 1969 Established tool for validation of non-formal and informal learning Overarching NQF will cover all levels and qualifications	Implemented but currently under revision	5 levels However an 8-level structure is being considered	Levels are described in terms of : - Knowledge - Skills - Competences However France do not use the terms of learning outcomes but speaks of competences. The use of learning outcomes is introduced for the needs of revision of qualification profiles	The referencing work to the EQF started in 2006 and is expected to be finalized in 2010
Germany	Only an NQF for HE is now implemented The overarching NQF will cover all levels and qualifications	NQF for HE implemented in 2005 Testing phase for metal, trade, health and IT industries	8 levels	Levels are described in terms of : - Professional competence (comprising knowledge and skills) - Personal competence (comprising social competences and self-competences). Generally, no specific focus on the learning outcomes is made	The referencing process started. A referencing report is expected to be submitted in 2011. After 2012, each formal certificate or diploma will refer to the corresponding EQF level
Ireland	NQF for all levels and qualifications (from primary education) implemented in 2003 The NQF allows recognition of formal, non-formal and informal learning	Implemented Introduced systems for credit transfer and recognition of non-formal learning	10 levels Four award types are included: major, minor, special purpose and supplemental	Levels are described in terms of: - Knowledge - Skills - Competences Following national agreed standards	The referencing to the EQF was completed in 2009 The Irish NQF is the first framework in Europe which will meet the EQF deadline of 2010
Spain	NQF for HE is implemented with, as main instrument, the national professional qualifications catalogue A system for recognition of non-formal and informal learning is introduced	Implemented an NQF for HE	5 levels	Levels are described in terms of: - Knowledge - Skills - Competences	Full integration with EQF will be available in 2011. First and eighth levels of EQF will not have any link to the Spanish QF

5. FOOD-FIT METHODOLOGY FOR THE DESCRIPTION OF THE LEARNING OUTCOMES

The Food-fit project has developed a proposed methodology for the analysis and description of the technician occupations, considered key in the food sector in several countries of the EU.

The description of the qualification has been made in the field of the European Qualifications Framework (EQF), using the concept of learning outcomes by defining knowledge, skills and competences.

5.1. Identification of occupations

The methodology used in the Food-fit project began with the identification of the most important occupations, according to the labour market, in the food sector in each country.

For the description of qualifications we had the collaboration of experts of the sector, who have provided relevant information on the learning outcomes expected by the labour market in different occupations. We have also used secondary sources and documentaries that have assisted in the establishment of these learning outcomes.

In the process of identification and description of occupations we used the following categories: name of the occupation; classification level in the International Standard Classification of Occupations (ISCO)¹⁶; identification of functional area; identification of the main functions and tasks required in the occupation; identification of the activity of the company, according to the international classification NACE¹⁷; estimated level of qualification in the EQF descriptors; level of education required in the occupation according to the ISCED¹⁸ levels; and a brief description of the evolution of the occupation, depending on whether it is a traditional, new or emerging occupation.

5.2. Occupation, knowledge area and learning outcomes

For the description of learning outcomes, Food-fit has used the concept of knowledge area and the concept of learning outcomes, through the definition of knowledge, skills and competences, as determined in EQF.

We used the EQF reference levels from 5 to 7, as the high qualified worker qualification in the sector is set in education levels within the European Higher Education Area.

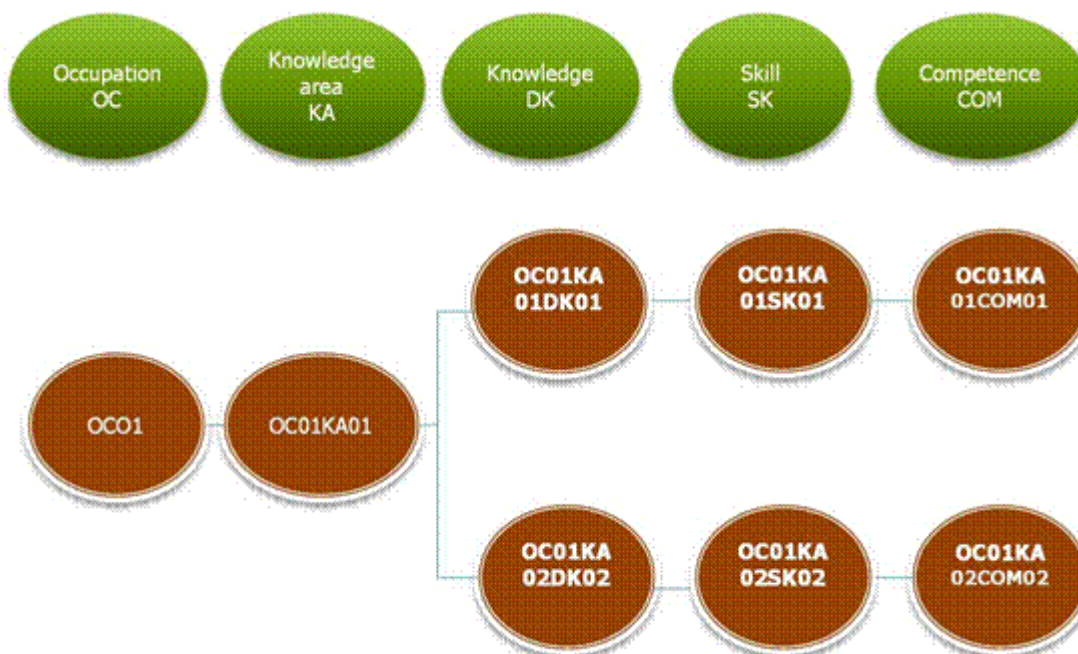
The concept of **knowledge area** was established, as a main reference field for the description of the qualification. So, an occupation may have one or several knowledge areas. Each knowledge area is formed by a learning unit, composed of knowledge, competences and skills.

¹⁶INTERNATIONAL LABOR ORGANIZATION. ILO/CINTERFOR: *Standard Classification of Occupations* <http://www.ilo.org/public/english/bureau/stat/isco/index.htm>

¹⁷EUROPEAN COMMISSION. NACE CODES: *Nomenclature générale des activités économiques dans l'Union Européenne*. <http://ec.europa.eu.com>

¹⁸ UNESCO. http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED_A.pdf

Diagram for the description of the qualification in the occupation



In this project we have established definitions that let us describe the learning outcomes, using the definitions of EQF as a main reference.

Learning outcomes: knowledge. According to the terminology of EQF, knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual. It is identified with the educative system (formal learning). Answering the question: Know what?

Learning outcomes: skills. According to the terminology of EQF, skills mean the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

It is the application of knowledge and the learning outcomes acquired through **labour experience**, in cognitive and practical terms. We should find them in the field of permanent training and in the job learning process. Answering the question: Know how?

Learning outcomes: competences. The definition of EQF identifies competence as the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.

It is the application of knowledge in a working environment¹⁹. This concept means the autonomy level in the performance of the job post and also the personal, social and organisational competences required in each occupation. Answer the question: How to behave?²⁰

**Example of learning outcomes in the occupation
Quality and Environment High qualified worker**

Knowledge area	Knowledge	Skills	Competences
Quality control	To define the procedure for the implementation and development/application of the quality plan in accordance with company policy.	To apply the quality plan in accordance with company policy.	Teamwork and cooperation. The intention to work cooperatively with others, to be a part of a team, to work together, as opposed to working separately or competitively.

5.3. Implementation of a common terminology

For the description of learning outcomes, we have used a common terminology for all countries, which is based on the use of action verbs (reference to Bloom's taxonomy) and on the identification of the more frequent social and organisational skills in the labour market.

Lexicon for the description of knowledge. For the description of knowledge in the Food-fit project we have used action verbs within the fields of knowledge, of comprehension and of the analysis of the situations.

- The field of knowledge implies the specific facts, the way of dealing with situations and problems. It means knowledge of the universal and specific abstractions in a particular field of knowledge. It refers to remembering information and to recognizing ideas, symbols, definitions, etc. The most commonly used verbs are: to define, to find, to describe, etc.
- The field of comprehension concerns the simplest aspect of understanding, which is to capture the direct sense of a communication or a phenomenon. Comprehension means understanding what has been learned, showing what has been learned. It has been proven that when information is presented differently, people are looking for connections and it can be transformed, associated to another fact, etc. The most suitable verbs are: to determine, to change, to draw conclusions, to recognize, etc.
- The field of the analysis involves dividing a whole into its parts and the perception of the same in relation to the whole. The analysis includes the knowledge of the elements, their connections, etc. It means that the employee sorts, distinguishes and relates structures or evidences of a fact. He asks questions, makes hypothesis, breaks down the whole into its parts, etc. The most appropriate verbs are: to analyse, to inspect, to examine, to discover, to prove, to relate, etc.

¹⁹ Tejada Fernández, J.; Navío Gámez, Antonio. "El desarrollo y la gestión por competencias profesionales: una mirada desde la formación". Grupo Cifo-UAB. Revista Iberoamericana de Formación.

²⁰ Tejada Fernández, J.; Navío Gámez, Antonio. "El desarrollo y la gestión por competencias profesionales: una mirada desde la formación". Grupo Cifo-UAB. Revista Iberoamericana de Formación.

Lexicon for the description of skills: For the description of skills in the Food-fit project we have used action verbs within the fields of implementation, synthesis and evaluation:

- The field of implementation of knowledge involves the interaction of general principles to specific cases learned by the employee. In this field it is assumed that a worker may use and apply the knowledge learnt in different contexts of use. The most common verbs are: to use, to implement, to solve, etc.
- The field of synthesis regards to the verification of elements that form a whole. The employee is able to decompose the whole into its parts and able to solve problems using the acquired knowledge. The most common verbs are: to organise, to plan, to propose, to elaborate, to design, etc.
- The field of evaluation includes a critical attitude towards the facts and is usually related to judgments relating to internal and external evidence. The verbs used are: to evaluate, to review, to verify, to decide, etc.

Description of competences. In the Food-fit project we have considered that social and organisational competences are involved in the description in terms of responsibility and autonomy of employees with a higher qualification level:

Social competences:

- Customer service orientation.
- Developing self and others.
- Impact and influence.
- Initiative.
- Interpersonal understanding.
- Self-confidence.
- Teamwork and collaboration.

Organisational competences:

- Analytical thinking.
- Conceptual thinking.
- Concern for order.
- Flexibility/adaptability.
- Organisational awareness.
- Sets and works to meet challenging goals.
- Team leadership.

5.4. Tools for the description of learning outcomes

Food-fit project has used two different key tools for the development of qualifications, which are: table including the action verbs and dictionary of competences with labour market value and alphanumeric coding criteria of learning outcomes.

Action verbs and dimensions of the competences

Knowledge	Skills	Competences
<ul style="list-style-type: none"> • To analyse • To base • To build • To compare • To define • To describe • To determine • To discover • To distinguish • To draw conclusions • To fix • To identify • To interpret • To investigate • To know • To observe • To point out • To select • To state 	<ul style="list-style-type: none"> • To adapt • To apply • To assess • To check • To choose • To classify • To compare • To compose • To contrast • To create • To deduce • To develop • To draw up • To encourage • To examine • To experiment • To finish • To handle • To implant • To implement • To manufacture • To order • To organize • To plan • To program • To prove • To rehearsal • To solve • To use 	<p>Social competences</p> <ul style="list-style-type: none"> • Customer service orientation. • Developing self and others. • Impact and influence. • Initiative. • Interpersonal understanding. • Self-confidence. • Teamwork and collaboration <p>Organisational competences</p> <ul style="list-style-type: none"> • Analytical thinking. • Conceptual thinking. • Concern for order. • Flexibility/adaptability. • Organisational awareness. • Sets and works to meet challenging goals. • Team leadership.

5.5. Implementation of the results: autodiagnosis and CV Europass

The application of this methodology has led to the description of the main occupations of the sector in terms of learning outcomes. This has led to the elaboration of an international inventory of occupations, levels 5-7, described in terms of learning outcomes.

From that inventory, the project has developed some computing tools to facilitate the professional guidance of the high qualified workers and also the management of human resources in companies.

Self-evaluation of qualification. The self-evaluation tool allows users to identify their qualifications (in terms of learning outcomes: knowledge, competences and skills) linked to the qualification expected by the companies of the sector for a specific job.

At the end of the process, users can identify the knowledge, competences and skills they need to improve their situation in the labour market in the sector. Thus, the user

can develop their own lifelong learning path, suitable for the characteristics of their own professional profile.

Elaboration of CV Europass. The Food-fit project has proposed a computing tool to elaborate CV Europass, using the description of learning outcomes required by the labour market. So, users will be able to make a *curriculum vitae* adapted to the qualification needs of the companies. The use of this tool will facilitate the transparency of the qualification of the workers in the sector²¹.

5.6. Opinion of the participants

Promoting the transparency of qualifications and strengthening of mutual trust.

The methodology used in Food-fit for the description of learning outcomes is based on the analysis of secondary sources (especially the training offer) and qualitative analysis with the participation of relevant experts in the sector. This methodology facilitates the connection between the needs of companies and the national occupational standards proposed by the national education authorities, which makes the learning outcomes transparent in the labour field and comparable between the Member States.

This methodology could generate mutual trust between public administrations, social partners, training centres and companies, necessary for the implementation and development of EQF in the sector. It could be a basis for the construction of learning agreements between stakeholders at both national and international levels.

Knowledge area is presented as the main reference to describe the professional qualification in terms of learning outcomes, because in all countries, the professional qualification is closely linked to the level of education and vocational training achieved by high qualified workers.

Difficulty in the harmonization of methodology and concepts. It is important to consider the differing situations between countries to describe learning outcomes in each of their national qualifications frameworks. For example, in the German holistic concept of competence, competence consists of knowledge, skills, social and self-competence. Knowledge is only one aspect of competence and there is an interdependence among the various aspects of competence. In this sense we can consider that the use of the area of knowledge can create some confusion of terminology in the description of qualifications.

Close description to labour reality. From the point of view of the labour market, it is very important that the qualification describes the reality of work in aspects of behaviour, knowledge and personal skills required by the occupation. Communication skills, sense of responsibility and ability to work in different contexts have a high valuation in the work environment.

Facilitation of the recognition of non formal and informal learning. Knowledge acquired through formal and informal channels is very important in the companies of the sector, characterized for working in a flexible context with rapid changes resulting from technology innovation and new forms of work organization. The methodology used in Food-fit is focused on the recognition of learning outcomes acquired through training in the workplace and through work experience in companies.

²¹ See Appendix 2 and 3 at the end of this document.

Facilitation for entering Europass CV and credit systems. Learning outcomes may be included in the Europass CV, because it refers to basic aspects of working life. The structure created from areas of knowledge will help creating units of learning outcomes that may be amenable to evaluation and accreditation, being necessary to identify learning agreements between stakeholders at both national and European level.

6. INVENTORY OF OCCUPATIONS, FUNCTIONAL AREAS AND LEARNING OUTCOMES

Based on a comprehensive and qualitative study in several EU countries, the Food-fit project has identified an inventory of technical occupations in the food sector, which will provide workers and public administrations, social partners, training centres and companies, with the identification of the professional qualification required in the labour market for these occupational profiles.

The inventory is presented below, together with an analysis of occupations by functional areas, a description of the functions of each occupation and the identification of the academic qualification level required for each of the occupations in the labour market.

6.1. Inventory of occupations

The Food-fit project has identified a total of 30 high qualified worker occupations that are considered relevant from the outlook of companies and labour market for the food industry in several European countries (see table below).

Relevant occupations in the food sector by country

Country	Occupations
Bulgaria	<ul style="list-style-type: none"> • Production manager • Machine engineer • Manager of control and quality • Manager of chemical processes • Logistic manager
France	<ul style="list-style-type: none"> • Production manager • Sales representative • Maintenance technician • Logistic manager • Nutritionist
Germany	<ul style="list-style-type: none"> • Engineer: food technology • Chemist: food chemistry • Engineer. Biotechnology • Engineer • Packaging technology • Business economist
Ireland	<ul style="list-style-type: none"> • Maintenance technician • Laboratory technician • Technical sales: marketing technician • Bio hazards technician • Front-Line management • Sales: customer services • Process technician • Health & safety technician • R&D technician
Spain	<ul style="list-style-type: none"> • Quality and environment technician • Production technician • Maintenance technician • R&D technician • Commercial technician • Health & safety technician

6.2. Functional areas

Functional areas where high qualified workers develop their professional activities are the following: Production, Quality and Environment, Maintenance, Sales, Research & Development, and Health & Safety.

Production Area. The main activities of this area include planning, management and optimisation of production or transformation lines, dealing with problems linked to input flows, quality of outputs and maintenance forecast, in order to never interrupt the line. The improvement of this area constitutes a big challenge to increase productivity rates and remain competitive.

The production area includes purchasing and logistic activities. Major activities in this functional area are purchases (supplier selection and price negotiation) and supply (management of flow of raw materials, packaging, etc.). It also includes the follow-up of plant components related to manufacturing or storage of finished goods in warehouses and the management of flow of goods sold (shipment).

Quality and Environment Area. The main objective of this area is to collect and analyse information on products, processes and services, and to take decisions regarding quality and environment. The quality department aims to develop and carry out the follow-up of the quality plan, and to implement the production control in accordance with food safety standards.

Maintenance Area. It is a relevant area due to the high automation of industries. Maintenance activities include planning, development and maintenance of facilities. People working in this area are mechanics, electricians, cleaning agents, or computer specialist. This area requires multi-skilled workers to ensure the introduction of new technologies and new machinery, monitoring and mending of existing ones, programming and development of information technology and telecommunications.

Sales Area. The marketing and sales area has the task of developing strategies to sell products through marketing, technical sales, distribution networks, sales promotion and export. It includes also communication and advertising activities. Principal goals are to sell products, build customer loyalty and expand market shares of the company. The administration is in charge of economic and financial parts, human resources and customer service.

Research and Development Area. The main activities in this area are the establishment and improvement of new food products, as well as the launch of existing products on the market, the improvement of in-house laboratories and the development of production lines. The research department is the basis of innovation in the industry. The quality department aims to standardise the quality plan, monitoring and control the production in compliance with food safety regulations.

Health & Safety Area. The main objective of this area is to deal with all aspects related to labour risks prevention, ensuring compliance with the standards of occupational safety in the workplace.

6.3. Occupations by functional areas

The most important high qualified worker occupations within each functional area are the following:

- Production Area

Bulgaria	France	Germany	Ireland	Spain
Production manager Logistic manager	Production manager Logistic manager	Engineer packaging technology	Front-line management Process technician	Production technician

- Quality and Environment Area

Bulgaria	Ireland	Spain
Manager of chemical processes Manager of control and quality	Bio hazards technician Laboratory technician	Quality and environment technician

- Maintenance Area

Bulgaria	France	Ireland	Spain
Machine engineer	Maintenance technician	Maintenance technician	Maintenance technician

- Research and Development Area

Germany	France	Germany	Ireland	Spain
Engineer: food technology Engineer biotechnology	Nutritionist	Chemist: food chemistry	Research and development technician	R&D technician

- Sales Area

France	Germany	Ireland	Spain
Sales representative	Business economist	Marketing Technician Sales: customer services	Commercial technician

- Health & Safety Area

Ireland	Spain
Health & safety technician	Health & safety technician

FOOD-FIT PROJECT

Occupations by functional area and by countries

Functional areas	Bulgaria	France	Germany	Ireland	Spain
Production	Production manager Logistic manager	Production manager Logistic manager	Engineer. packaging technology	Front-line manager Process technician	Production technician
Quality and environment	Manager of chemical processes Manager of control and quality	--	Chemist: food chemistry	Bio hazards technician Laboratory technician	Quality and environment technician
Maintenance	Machine engineer	Maintenance technician	--	Maintenance technician	Maintenance technician
Research and development	--	Nutritionist	Engineer: food technology Engineer. biotechnology	R&D technician	R&D technician
Sales	--	Sales representative	Business economist	Marketing technician. Sales: customer services	Commercial technician
Health & safety	--	--	--	Health & safety technician	Health & safety technician

6.4. Description of the occupations

Next we will present a description of the functions required for the occupations of technician of the different participant countries in the Food-fit project.

Bulgaria

- **Production manager.** The main tasks expected in this occupation are the following: He/She manages and distributes all human resources, materials, techniques and carries out daily efficient management. He/She solves common problems of production and ensures compliance with hygiene and safety, as well as all administrative procedures. He/She manages costs and manages the economic indicators of the unit.
- **Logistic manager.** He/She manages and distributes all human resources, materials, techniques and carries out daily efficient management. He/She solves common problems of production and ensures compliance with hygiene and safety, as well as all administrative procedures. He/She manages costs and manages the economic indicators of the unit.
- **Manager of control and quality.** The main tasks expected in this occupation are the following: He/She controls the final quality of the products and supervises the whole production process. He/She is responsible and observes the products' compliance with the requested quality standards implemented in the company (most ISO 2001:2000). He/She evaluates and chooses the company suppliers, controls the medium management level in the company and if needed replaces the General Manager of the company.
- **Manager of chemical processes.** The main tasks expected in this occupation are the following: He/She controls and manages chemical and technological processes in the food and beverage production. He/She coordinates the maintenance and repair of industrial installation and controls technological aspects to the products and materials. He/She participates in the analysis and certification of the final production.
- **Machine engineer.** The main tasks in this occupation are the following: He/She performs technical maintenance, adjusting and mending of machinery and manages their functioning. He/She tests and consults technological aspects of materials, products or processes, participates in modification or evolution of facilities: test, development, operational test. He/She provides reporting activities.

France

- **Production manager.** The main responsibilities in this occupation are the following ones: He/She manages all human resources, materials, techniques and flow of his/her unit. He/She plans the work of the team and solves common problems of production. It ensures compliance with hygiene and safety. It manages costs and manages the economic indicators of the unit.
- **Sales representative.** The main tasks in this profile are the following: He/She contributes to the development of sales in respect of the implementation of trade policy. He/She operates on a set of sales points within a specific geographical area, with a number of clients. To achieve his/her objectives in

quantity and quality, sales representative provides advice and services to customers.

- **Maintenance technician.** This occupational profile provides the current preventive maintenance: adjusting, oiling, changing parts, control levels. He/She performs technical mending of machinery. He/She participates in modification or evolution of facilities: test, development, operational test. He/She provides used and reporting activities.
- **Logistic manager.** This occupational profile organizes material, human, technical and information flow relating to the logistic unit. It manages a team of logistic operators. He/She contributes to the continuous improvement of the function entrusted to him/her, both in the organization or operation of flow and about staff or innovation.
- **Nutritionist.** The main tasks in this occupation are the following ones: He/She manages feasibility studies and setting up of new products according to nutritional, scientific and regulatory aspects. He/She monitors relating essays and certifications.

Germany

- **Engineer. Food technology.** Engineers in food technology plan, prepare and control processing and manufacturing processes in the food industry. They develop new products and ingredients or improve existing products and ingredients. Furthermore they design machines and plants or production procedures.
- **Chemist. Food chemistry.** Chemists in food chemistry analyse and evaluate the properties of food products, their ingredients and chemical reactions of food components. Furthermore they examine consumer goods for their tolerability. Moreover they are engaged with research for example to further develop chemical, biochemical and microbiological analysing methods.
- **Engineer in biotechnology.** Engineers in biotechnology analyse biological processes of cells as well as cell components in order to reproduce them for utilizing them for applications in nutrition, health and environmental protection. They work with methods from molecular and biochemistry as well as process and control engineering and bioinformatics.
- **Engineer in packaging technology.** Engineers in packaging technology plan design and improve packaging and packaging processes. They develop economic solutions for the production of packaging and packaging materials with regard to economical material- and process-oriented aspects.
- **Business economist (professional school) – cattle and meat.** Business economists for cattle and meat take over commercial and business tasks and executive functions at the intermediate level. For companies of the meat industry they perform tasks for retail, sales and marketing as well as finance and the administration of inventory.

Ireland

- **Health & safety technician.** Ensuring compliance with Health & Safety Regulations and legislation.
- **Process technician.** Supporting manufacturing process during development, installation and operation.
- **Maintenance technician.** Maximising uptime, reducing downtime and improving equipment life and performance.
- **Laboratory technician.** Providing test and analytical facilities to ensure process and regulatory compliance.
- **Technical sales/marketing.** Developing new business opportunities for existing products.
- **Front line management.** Providing leadership and direction to a better educated workforce.
- **Bio hazards technician.** Working closely with all functions to reduce/eliminate work-related illness and accidents.
- **Research and development technician.** Responding to present and future business, customer needs through new product/process development.
- **Sales/customer services technician.** Responding to customer needs and ensuring these are fully satisfied.

Spain

- **Quality and environment technician.** He/She performs his/her activity in the functional area of Quality and Environment. The main function of this occupation is to gather and analyse information about the products, processes and services which shall serve for taking decisions about quality and environment.
- **Production technician.** He/She performs his/her tasks in the functional area of production and his main duties are organizing a production unit and optimising production lines with regard to the management of human and material resources, logistic and tasks. The knowledge level required by companies to perform the occupation is Engineer, Graduate or Higher Level Technician. This functional area is characterized by the incorporation of new technologies, the capacity to organize human resources in line with the requirements of production and the automation of production processes.
- **Maintenance technician.** He/She performs his/her activity in the Industrial Maintenance Department. His main function is to draw up preventive and/or corrective maintenance plans as well as to analyse information about machines and installations and put forward solutions which cater for production incidents. The knowledge level required by companies to perform the occupation is Engineer, Graduate or Higher Level Technician.

- **R&D technician.** He/She performs his/her occupation in the R&D Department and in Product Development. His main function consists of gathering, analysing and examining the products of the market with a view to studying the form of innovating, adapting and implementing new products at the company.
- **Commercial technician.** He/She performs his/her activity in the Sales area. His main function is to commercialise company production based on a specific knowledge of the product and its commercial presentation, the legal and financial aspects of the sale of products and carrying out activities to support commercialisation.
- **Health & safety technician.** The functional area corresponding to this profile may be Risk Prevention, though on many occasions this activity is carried out in other areas such as Quality and Environment, Production or Administration. The main duty of this technician is to implement, along with the legal representation of the workers (RLT) and the company management, all those aspects related with the prevention of labour risks.

6.5. Occupations and levels of academic qualification

Most of the countries that form the Food-fit association have not yet defined their national qualifications framework (Bulgaria, Germany, Spain), so that at the time of writing this report, it is very difficult to use the levels of the European Qualifications Framework (EQF) to establish the comparability of qualifications. The only criterion which expresses an agreement among all participants in the project is to delimit the qualification of technicians in level 5 and 7 of the EQF.

Moreover, based on the level of education required by companies in these occupations, you can set the following comparison using the ISCED²² levels 5 and 6, as follows:

- ISCED 6. Second stage of tertiary education (Doctorate, Master).
- ISCED 5a. First stage of tertiary education (Bachelor).
- ISCED 5b. First stage of tertiary education: not university tertiary programmes (VET higher level).

Next we will present a comparison of the qualification level by areas.

Production Area

As shown in the table below, the required studies in the area of production are in the higher education area and in the higher VET area. We consider it is necessary to have university studies in the following occupations: production manager, engineer, packaging technology, process technologist / technician and production technician.

It is also considered that higher VET studies are adequate for the occupations of: logistic manager, front-line management.

Production manager (FR) and production technician (ES) are both adequate for the development of the occupation.

²² UNESCO (1997): ISCED. *International Standard Classification of Education*.
http://www.uis.unesco.org/TEMPLATE/pdf/isced/ISCED_A.pdf

ISCED Codes	Production Area				
	Bulgaria	France	Germany	Ireland	Spain
ISCED 5a	Production manager	Production manager	Engineer. Packaging technology	Process technologist /technician	Production technician
ISCED 5b	Logistic manager	Logistic manager	--	Front-Line management	

Quality and Environment Area

Level ISCED 5A is considered for the following occupations: manager of chemical processes, manager of control and quality, chemist: food chemistry, bio hazards/ occupational health and quality and environment technician.

Level ISCED 5b for the occupation of laboratory technician.

ISCED Codes	Quality and Environment Area		
	Bulgaria	Ireland	Spain
ISCED 5a	Manager of chemical processes Manager of control and quality	Bio hazards technician	Quality and Environment technician
ISCED 5b	--	Laboratory technician	--

Maintenance Area

In this area, level ISCED 5a is considered necessary for technical maintenance technician (IE) and level ISCEC 5b for the occupation of maintenance technician.

In Spain and Bulgaria ISCED 5a and 5b are considered adequate.

ISCED Codes	Maintenance Area			
	Bulgaria	France	Ireland	Spain
ISCED 5a	Machine engineer	--	Maintenance technician	Maintenance technician
ISCED 5b		Maintenance technician	--	

Research and Development Area

ISCED Codes	Research and Development Area			
	Germany	France	Ireland	Spain
ISCED 6	--	Nutritionist	--	--
ISCED 5a	Engineer: Food technology Engineer biotechnology Chemistry. Food chemistry	--	R&D technician	R&D technician

In this area it is necessary to have ISCED 6 level for the occupation of nutritionist. Level ISCED 5a is considered necessary for the occupations of: Engineer: food technology, engineer, biotechnology, chemistry -food chemistry- and R&D technician.

Health & Safety Area

In this area it is necessary to have ISCED 5a level in the occupation of health & safety Technician (IE). For the same occupation in Spain, levels 5a and 5b are adequate.

ISCED Codes	Health & Safety Area	
	Irlanda	España
ISCED 5a	Health & safety technician	Health & safety technician
ISCED 5b	--	Health & safety technician

Sales Area

In this functional area, level ISCED 5b is adequate for the occupations of: sales representative, business economist, technical sales/marketing technician, sales/customer services, commercial technician.

ISCED Codes	Sales Area			
	France	Germany	Ireland	Spain
ISCED 5b	Sales representative	Business economist	Marketing technician Sales/customer services	Commercial technician

Approach to an organization chart: occupations by education level and functional areas

Education level (ISCED Codes)	Production Area	Quality and Environment Area	Maintenance Area	R&D Area	Sales Area	Health and safety Area
ISCED 6. Second stage of tertiary education (Doctorate, Master)	--	--	--	- Nutricionist	--	--
ISCED 5a. First stage of tertiary education (Bachelor)	-Production manager -Production technician -Process technician -Engineer Packaging technology	-Quality and environment technician -Manager of chemical processes -Manager of control and quality -Bio-hazards technician	-Machine engineer	-Engineer food technology -Engineer Biotechnology -R&D technician -Chemistry Food chemistry	--	-Health and safety technician
ISCED 5b. First stage of tertiary education: not university tertiary programmes (VET, higher level).	-Logistic manager -Front-line manager	-Laboratory technician	-Maintenance technician	--	-Sales representative -Business economist -Commercial technician -Sales: customer services -Technical sales: marketing technician	-Health and safety technician

6.6. Occupations and learning outcomes

The qualification of each occupation is described in terms of learning outcomes (knowledge, skills and competences) related to knowledge areas (see previous chapter). Below is a list of the most important knowledge areas in each of the occupations, classified into functional areas.

Production Area

- **Production manager.** This occupation is important in France and Bulgaria. The common knowledge areas are: team management, production control, industrial engineering and maintenance, economic and administrative management. In Bulgaria, in addition to the previous areas, foreign languages play also an important role. In France logistic, purchasing and warehouse and production and quality control are also part of the Production Manager attributions..
- **Logistic manager.** This is a relevant occupation in France and Bulgaria. In both countries the following knowledge areas are considered relevant: team management, logistic, purchasing and warehouse; economic and administrative management. In France, quality control is considered too.
- **Engineer. Packaging technology.** The most outstanding knowledge areas are: planning, design and improvement of packaging and packaging processes.
- **Front-line management.** The most relevant knowledge areas are: production and quality control management.
- **Process technician.** The most important knowledge areas are: Manufacturing engineering and process development project & Quality Control.
- **Production technician.** The most relevant areas are: production programmes, task assignment systems, production control methods, production unit control: cost calculation, stock management, operating procedures and processes.

Quality and Environment Area

- **Manager of chemical processes.** The most important knowledge areas are: Chemical and industrial engineering and biotechnologies, production management, product control.
- **Manager of control and quality.** The most relevant knowledge areas are: Team Management, Quality Control, Foreign Language and Administrative Management.
- **Chemist: food chemistry.** The most important knowledge areas are: the structures and properties of food products, their ingredients and chemical reactions of food components.
- **Bio hazards technician.** The most relevant knowledge areas are: Environmental Protection, legislation and regulatory requirements.
- **Quality and environment technician.** The most important knowledge areas are: Food safety, Quality control, Waste management, Materials resources management (water, electricity, gas, gas oil...).

Maintenance Area

- **Machine engineer.** The most important knowledge areas are: Industrial engineering and maintenance, Safety in Work Place Environment.
- **Maintenance technician.** In France the following knowledge areas are relevant: industrial engineering and maintenance, safety in work place and environment.
- **Maintenance technician.** In Spain, the following knowledge areas have been identified: analysis of machinery technical documentation and design of written procedures, programming setting-up for machines and facilities, programming techniques, supervision and maintenance of machinery, industrial equipment and automated lines, and costs estimation.
- **Maintenance technician.** In Ireland three knowledge areas have been identified: electrical/mechanical engineering technology, food hygiene/health & safety and preventive maintenance technology.

Research and Development Area

- **Engineer: food technology.** The outstanding knowledge area is to plan, prepare and control manufacturing processes.
- **Engineer: biotechnology.** The most important knowledge areas are analysis of biological processes of cells as well as cell components in order to reproduce them for uses in nutrition, health and environmental protection.
- **R&D technician.** Knowledge areas are focused on the new applications for existing products and/or development of new/improved products, new applications for existing processes and/or development of new/improved processes.
- **R&D technician.** The most outstanding knowledge areas are: dietetics and nutrition, food legislation and standardisation, food biochemistry and chemistry and food technology.
- **Nutritionist.** The most important knowledge areas are: Product development, R&D with focus on nutritional aspects, team management, food safety, economic and administrative management.

Health & Safety Area

- **Health & safety technician.** The most important knowledge areas for companies are: managing risk prevention, evaluating and controlling risks: safety conditions, evaluating and controlling risks: working environment, evaluating and controlling risks: workload, acting in emergency situations and production unit control.

Sales Area

- **Business economist.** The most important knowledge areas are focused on Commercial and business tasks and executive functions at intermediate level.
- **Sales representative.** The most important knowledge areas are the following: team management, marketing, purchasing and publicity, economic and administrative management.
- **Technical sales/marketing technician.** The most important knowledge areas are: sales/marketing in food industry, information technology, quality/audit systems.
- **Sales/customer services.** The most relevant knowledge areas are: sales, customer liaison and support and process and quality.
- **Commercial technician.** The most outstanding knowledge areas are: carrying out sales and purchasing operations, working on advertising actions and knowing the distribution channels.

7. EDUCATIONAL AND TRAINING OFFER FOR HIGH QUALIFIED WORKERS

7.1. Scenery for training offer: Bologna and Copenhagen Processes

Within the last decade, the processes of Bologna (European Higher Education Area, EHEA²³) and Copenhagen²⁴ (vocational education and training, VET) have promoted the use of learning outcomes for defining and describing qualifications.

The Copenhagen process specifically calls for assuring open pathways and parity of esteem between vocational education and training, and general/higher education. The introduction of new style qualifications frameworks in Higher Education and the European Qualifications Framework for lifelong learning (EQF²⁵) based on learning outcomes is urging authorities and stakeholders to reconsider the relationship between their separate frameworks and educational offers for General Education, Vocational Education and Training (VET) and Higher Education (HE).

Bologna Process: In Bergen (19-20 May 2005), the European Ministers responsible for Higher Education adopted in their communiqué an “overarching framework for qualifications in the European Higher Education Area (EHEA), comprising three cycles (including, within national contexts, the possibility of intermediate qualifications), generic descriptors for each cycle based on learning outcomes and competences, and credit ranges in the first and second cycles”²⁶. As mentioned in this communiqué, the complementarity between the framework for qualifications in the EHEA – FQ-EHEA - and the qualifications framework for lifelong learning – EQF - should be ensured.

The EQF, formally adopted as a European Recommendation on 23 April 2008, is built upon eight reference levels which describe qualifications in terms of learning outcomes,

²³ European Commission (2010):). *The Bologna Process - Towards the European Higher Education Area*. http://ec.europa.eu/education/higher-education/doc1290_en.htm

²⁴ European Commission (2010): *Copenhagen Process*: http://ec.europa.eu/education/vocational-education/doc1143_en.htm

²⁵ Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning.

²⁶ http://www.eua.be/fileadmin/user_upload/files/Quality_Assurance/050520_Bergen_Communique.pdf

ranging from basic (Level 1) to advanced (Level 8)²⁷. It encompasses all levels of qualifications acquired in general, vocational as well as academic education and training. Additionally, the EQF addresses qualifications acquired in initial and continuing education and training. The learning outcomes are “defined as a statement of what a learner knows, understands and is able to do on completion of a learning process (...) they are specified in three categories – as knowledge, skills and competence. This signals that qualifications – in different combinations – capture a broad scope of learning outcomes, including theoretical knowledge, practical and technical skills, and social competences where the ability to work with others will be crucial”²⁸.

Finally, European employers stress the importance of focusing on learning outcomes in higher education as well as in vocational training. They consider it as a precondition for sustaining the employability of graduates, increasing the international attractiveness of the European Education Area as well as for strengthening the permeability between all sectors of education to make lifelong learning a reality²⁹. This emphasis on learning outcomes seems to be shared by higher education institutions: universities have committed themselves in the European Universities Charter on Lifelong Learning (2008³⁰) to develop and implement lifelong learning strategies including development of educational provision within the framework of structured partnerships and implementation of recognition of all forms for prior learning. For the time being the drive to redefine qualifications and curricula using learning outcomes has been most clearly seen in VET, learning outcomes have a rather limited impact on higher education at present as the Bologna process is concentrating mainly on commonly agreed developments of two-tier cycles structures.

7.2. Educational/vocational routes in the countries

By its very nature, the manufacture of food products and beverages (NACE Code 10, 11) involves a bewildering variety of raw materials (most of which come from the nature and thus are subject to wide inherent variation), specialist processing technologies and unique product packaging, storage and distribution requirements. This is one key variable in a complex equation, and so in order to explore the future training requirements of such a diverse group of high qualified workers -- see table below -- it is first necessary to acknowledge the wide diversity that exists within the food and beverage sector.

In general, the sector has responded positively to the increased customer/quality demands, regulatory requirements, environmental and food safety legislation and the competitive pressures applied by the multi-national distribution chains. This success is due to the industries' ability to embrace the necessary changes it has faced. A significant part of the successful response to change has been the emergence of new occupations and the enlargement of existing “traditional” occupations in direct response to many challenges faced by the sector.

The project began with the identification, with the collaboration of experts within the sector, of these occupations. These newly emerging and expanded existing occupations occur across all functional areas, i.e. from goods inwards through

²⁷ The present technical specifications are referring to qualifications offered at levels 6 to 8 of the EQF.

²⁸ http://ec.europa.eu/dgs/education_culture/publ/pdf/eqf/broch_en.pdf

²⁹ BUSINESSEUROPE (2007): *Position on the Employability of Graduates*. May 2007.

<http://www.busineurope.eu/Content/Default.asp?PageID=609>

³⁰ European University Association asbl. European universities' charter on lifelong learning.

http://www.eua.be/fileadmin/user_upload/files/Publications/European_Universities__Charter_on_Lifelong_Learning.pdf

processing and its support operations; from research and development through sales; and they reflect the recent focus on health and safety and environmental considerations. The project research demonstrated this and the full list of occupations, and their related functional areas, are highlighted in table below.

List of project identified occupations and their related function areas

Functional Area	Occupation
Production area	Engineer. Packaging technology
	Front-line manager
	Logistic manager
	Process technician
	Production manager
	Production technician
Quality and Environment area	Bio-hazards technician
	Laboratory technician
	Manager chemical processes
	Manager control and quality
	Quality and environment technician
Maintenance area	Machine engineer
	Maintenance technician
Research and Development	Nutritionist
	Chemist: food chemistry
	Engineer. Byotechnology
	Engineer: food tecnology
	R&D technician
Sales area	Sales representative
	Business economist
	Commercial technician
	Sales: customer services
	Technical sales: marketing technician
Health & safety area	Health & safety technician

The educational routes that are available to potential high qualified workers, as they consider their career options, vary considerably from country to country.

In Bulgaria, for example, a student upon completion of secondary education may attend a general university and attain a Bachelor (EQF Level 6), Masters (EQF Level 7) and Doctorate (EQF Level 8) degrees. Another option available is to attend a specialised university such as the University of Food Technology in Plovdiv – one of three such specialist education institutions -- and receive similar equivalent qualifications. These institutions offer diploma and specialist degrees (EQF Level 5).

In France, vocational education and training is well represented with the certificate of vocational aptitude (CAP) and certificate of vocational training for adults (CFPA) which complies with Level V of the French National Qualification Framework. Vocational diplomas (BP) and technical certificates (BT) comply with Level IV. The academic diploma of Technology (DUT) and higher technical certificate (BTS) signal the end of undergraduate higher education, and this can be followed by Academic License, Masters and Doctorate degrees.

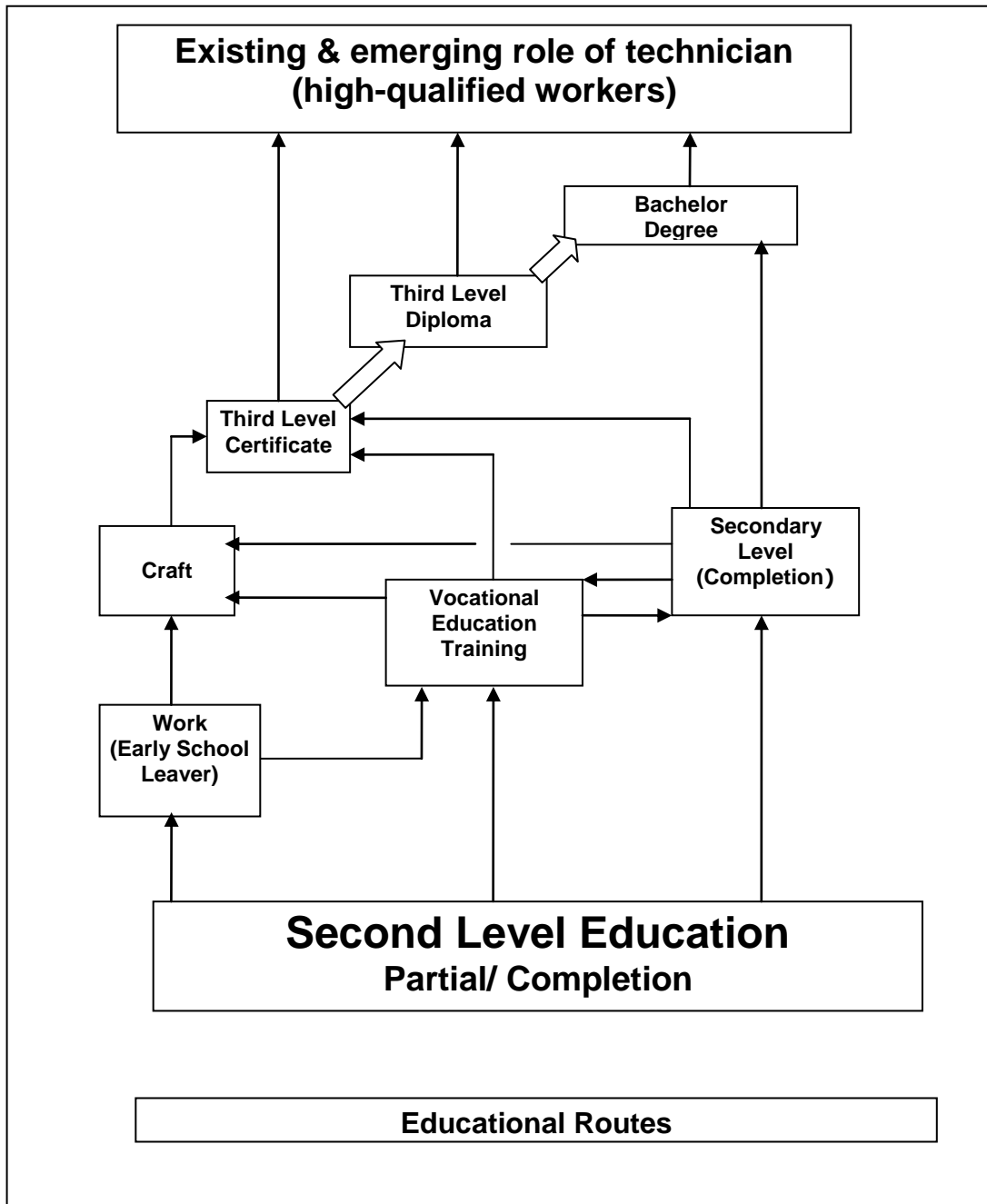
In Germany, after receiving appropriate vocational training and several years of experience it is possible to enter higher education system which includes universities and universities of co-operative education (Berufsakademien). Attending universities of co-operative education requires half of the studies to be conducted in the workplace. This part-time approach to learning leads to a master craftsman or a technician diploma. Formal university admission is normally with the general qualification entrance (Abitur) or the advanced vocational certificate of education (Fachabitur). This is the traditional route to bachelors and post-graduate degrees.

In Ireland the introduction of Further Education and Training Awards Council (FETAC) and Higher Education and Training Awards Council (HETAC) allowed students to move, if they so desired, from traditional vocational education into higher education and thus made access available to certificate, diploma and degree programmes. This progression was supported by the introduction of regional institutes of technology that were set up originally to provide for the emerging technological requirements of a developing economy. These provided the technical skills for the craftsmen and technicians needed by industry, while the traditional universities provided access to bachelor, masters and doctorate degrees. It is important to note the significance of the roles played by FETAC, HETAC and the regional institutes of technology. Before their establishment many technical qualifications could only be attained from institutions from outside the country, i.e. the City & Guilds of London.

In Spain, training opportunities for high qualified workers in the food and beverage industry are located in the National Professional Qualifications Catalogue. The Ministry of Education (MEPSYD) is working on the adaptation of professional training titles to National Professional Qualifications Catalogue. It is interesting to note that a recent new title addition is “higher technician in quality control and analysis laboratory” which appears to be a combination of several activities identified by the project experts in the project-research.

7.3. Educational Challenges in the food sector

This brief summary of the educational/vocational training structures that are available to high qualified workers in the food sector across the project countries serves to illustrate the multitude of vocational educational and academic routes that are available. This is another key variable in a complex equation, and so in order to illustrate this, it is proposed to attempt to show, in the broadest possible general terms, the different educational routes that are available to such high qualified workers as they seek to acquire knowledge develop skills and increase competences. This is shown in Figure below.



It is clear that a variety of routes are open to potential high qualified workers in the industry. It is possible for a process operator --who may have been an early school-leaver for a wide assortment of reasons --to move into the high qualified worker ranks. This route generates high qualified workers with good practical product/process skills but who perhaps lack the formal theoretical knowledge to support their experiential learning. On the other hand, a high qualified worker who has travelled the academic route will have all the formal theoretical knowledge but will lack practical experience in a manufacturing environment. A time-served craftsman may also progress to the grade of high qualified worker, and in so doing brings real “hands-on” skills and knowledge to that position. All three bring very different skill-sets to the job, and have further (different but complementary) training requirements if they are to be effective in the workplace. In Ireland there is an old saying that highlights the balance needed between

academic and vocational education, which states, “you go to school to get a B.A.³¹ ... then you go to work to learn the rest of the alphabet!”.

Whatever route is taken to the high qualified worker grade, the knowledge and skills required to be effective in the workplace are directly related to a variety of local influencing factors; namely product, process, safety/environmental and business issues. For example, a highly skilled process high qualified worker who works in a wine-making facility will not have the skills to support a meat-processing plant, hence the necessity for specific product/process training.

However, competences are more generic in nature and are defined as the proven ability to use knowledge, skills and personal, social and/or methodological abilities in work/study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy. In general, it is the application of knowledge in a working environment. For example, a high qualified worker who uses his/her capability for analytical thinking for problem solving and then takes the initiative to implement the solution is invaluable to any organisation. There is, however, no doubt that detailed process/product knowledge enables the optimum use to be made of such generic problem-solving tools/techniques.

Contributions to the project research from our local experts indicate clearly that competences such as those mentioned in Table below are highly sought after and much valued.

Local influencing factors

Local Influencing Factors	Knowledge/Skills Specialist in nature and with limited “local” application	Competence Generic in nature and widely applicable across industry
Product	Food safety Nutrition/dietetics Hygiene Regulatory Requirements Research & Development Quality Control Quality Assurance Food Science Chemistry Packaging	Analytical thinking Problem solving Initiative Flexibility/adaptability Communications Set and meet challenging goals
Process	Engineering Technology Maintenance Technology Production management Front line management Team skills OEM (Original Equipment Manufacturer)	Analytical thinking Problem solving Initiative Flexibility/adaptability Communications Set and meet challenging goals
Safety/Environment	Health & Safety Environmental Waste treatment/management Bio Hazards Occupational Health	Analytical thinking Problem solving Initiative Flexibility/adaptability Communications

³¹ Bachelor of Arts primary degree.

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		Set and meet challenging goals
Business	Sales & Marketing Customer Support Legislation Commercial acumen Languages Supply Chain management Logistics	Analytical thinking Problem solving Initiative Flexibility/adaptability Communications Set and meet challenging goals

It is therefore, the right blend of knowledge, skills and competences that provide organisations with the competitive edge. This requires continuous investment in the most valuable asset within the company *i.e.* the workforce. Training is often viewed as simply a cost and the benefits are not considered to have any impact on bottom line performance. How can this thinking be reversed? It is clearly not easy and many organisations fail to provide budgets for adequate training and so continually struggle to get the knowledge/skills/competence combination correct, and so fail to deliver optimum organisational performance. Establishing a mechanism to measure/monitor the direct linkage between levels of knowledge/skills/competence and bottom line performance would encourage adequate resourcing of workforce training.

8. SUMMARY AND CONCLUSIONS

The Guide for the implementation of the EQF in the food sector aims at informing Public Administrations, social partners, training centres and companies about the need of describing qualification of high-qualified workers of the sector, in terms of learning outcomes (knowledge, competences and skills), in order to improving transparency of qualifications and to increasing labour mobility within the sectoral qualifications framework in the European Union.

The main topics identified in this guide are the following: the food sector in the European Union, the learning outcomes in the European Qualifications Framework, the correspondence between the EQF and the National Qualifications Frameworks (NQFs), the Food-fit methodology for the description of the learning outcomes, the inventory of occupations in the food sector, the education/training offer for the food high qualified workers.

8.1. Food sector in the EU

The food and beverage sector is the second manufacturing sector in the EU with an annual production over 600 billion € and an employed population over 4.7 million workers.

Most companies of the European food sector are SMEs (99.1%), employing 63% of the food workers and generating 48.5% of the business turnover. This predominance of SMEs involves a huge sector fragmentation. It may be linked to low productivity and profitability of the products and to an increase of the production costs, which makes SMEs more vulnerable in the unfavourable cycles of economy.

Nevertheless, the sector is also affected by concentration. Indeed, it is a side effect of globalisation: the biggest companies are merging with smaller ones, gaining more

power and influence on the market. It participates to weaken SMEs and the overall reactivity of the sector.

The retail sector is also gaining an increasing power both on producers and consumers. Their power on fixing prices and determining their suppliers is affecting the overall sector.

In order to stimulate sector growth and to strengthen competitiveness, it is necessary to increase investment in the professional qualification of workers, as well as to increase the efforts in the R&D area. Both improvement of qualification and improvement of R&D, are considered strategic factors that are essential for the development of productivity and competitiveness in the sector. Other main aspects are: optimisation of processes, environment, nutritional aspects, supply chains and consumer needs.

8.2. Learning outcomes and European Qualifications Framework (EQF)

EQF started to be developed in 2006, promoted by the European Commission, as a referent tool for the different European qualification systems and frameworks. EQF became officially effective on 2008. The year 2010 has been established as the recommended deadline for the Member States to carry out the referencing of their national qualification systems to EQF, and the year 2012 for the individual qualification certificates to have a reference to the corresponding EQF level.

EQF takes into account the huge diversity existing among national systems and facilitates conversion and comparison of qualifications among countries. The main characteristics of EQF are defined in 8 reference levels, described in terms of learning outcomes, which have been defined as: "expression of what a person knows, understands and is able to do at the end of a learning process; it is defined in terms of knowledge, skills and competences".

Descriptors have been established to cover the whole range of learning outcomes, regardless the educative or institutional context, from basic education to doctor/higher qualified professionals, passing through school and basic levels of unskilled workers, therefore, covering all forms of learning, that is, formal, non formal and informal.

In the following graphic representation a vertical reading can be made, which is identified with reference levels, and also, a horizontal reading, corresponding to learning outcomes.

EQF descriptors

Eight levels	Learning outcomes		
	Knowledge	Skills	Competences
Level 1			
Level 2			
Level 3			
Level 4			
Level 5			
Level 6			
Level 7			
Level 8			

The EQF has an important impact on three relevant spheres of the professional field: education/occupation; higher education; national qualification frameworks:

- **EQF and occupations.** EQF constitutes a new instrument that allows for the combination of educative and occupational taxonomies, and, to a certain extent, can be used as a link between ISCED and ISCO³².
- **EQF and higher education.** EQF guarantees compatibility with the qualification framework of the European Higher Education Area (EHEA). The highest levels of EQF have been defined according to EHEA descriptors, in order to avoid the development of two isolated frameworks. Therefore, learning outcomes from certain EQF levels correspond to the descriptors defined in the EHEA qualification framework. There are clear crossed references in levels 5 and 8.
- **EQF and national qualification frameworks.** The aims of the different qualification frameworks may vary according to their context (if they are for international, national, regional or sectoral comparison), which will affect their specific design. EQF has been designed as a meta-framework, and therefore, it uses descriptors that are more general than the majority of the national, regional or sectoral frameworks.

8.3. Correspondence between NQFS and EQF

All countries are making efforts to refer their qualification systems to the common European tool (EQF), especially in the field of the professional qualification of high qualified workers. Their main difficulties are linked to the fact that many separate national acts have to be combined into one common framework and that some differences are so important that the stakeholders in the education and training systems in those countries prefer to keep their existing systems, as illustrated in the German case for instance.

³² ILO/CINTERFOR (1988): *International Standard Classification of Occupations. ISCO*. <http://www.ilo.org/public/english/bureau/stat/isco/index.htm>

However, all countries are interested in implementing a system of credit transferability and recognition of informal or non-formal learning since they recognise that this will foster the mobility of workers and the transparency of qualifications - final aim of the European Lisbon strategy.

In the field of EQF, we can conclude that high qualified workers could be able to recognise their qualification in all 5 Food-fit countries in 2012 when all overarching NQF systems are available.

The future situation in the food industry for employees is difficult to anticipate now as no defined deadlines in the EC countries have been set to establish sectoral qualification frameworks. The sectoral approach of the frameworks is possible but requires prompt communication between all relevant stakeholders which is not an easy task for all countries.

8.4. Food-fit methodology for the description of the learning outcomes

The main objective of the methodology proposed in the Food-fit project is the description of professional qualifications of the technicians who work in the food sector, taking as main reference the European framework and national frameworks, national qualification frameworks, higher education and VET, lifelong learning and the needs of the labour market in this sector.

For the description of qualifications we had the collaboration of experts of the sector, who have provided relevant information on the learning outcomes expected by the labour market in different occupations. We have also used secondary sources and documentaries that have assisted in the establishment of these learning outcomes.

The first stage of work has been to identify key occupations in the sector, for which we have used the most important international classifications in economic, educational, labour and occupational subject, such as NACE, ISCO, ISCED.

The description of the qualification in each occupation is carried out using the concept of "knowledge area", which works as a reference unit for the description of the learning outcomes. Thus, an occupation may have one or more knowledge areas which will identify knowledge, skills and competences required for employment.

Once the qualification has been described in each of the occupations, a common terminology has been implemented, based on the using of action verbs and definitions extracted from the dictionaries of competences most frequently used in the labour market.

Thus we have obtained an inventory of qualifications, which let us develop a website that includes some tools that can contribute to the implementation of the EQF in the food sector in Europe.

From the evaluation carried out by the project participants, we come to the conclusion that the transparency of the learning outcomes obtained through the methodology proposed in the Food-fit project could be a solid theoretical base to enhance mutual confidence among stakeholders, which would provide a better mobility of the technicians, within a sectoral framework of qualifications in the European field.

8.5. Inventory of occupations, functional areas and learning outcomes

Food-fit project has identified an inventory that includes 30 high qualified worker occupations, which are considered key to the food companies in the participant countries of the project.

Likewise, the project includes six functional areas where high qualified workers perform their professional activities, such as: Production, Quality and Environment, Industrial Maintenance, Research and Development, Health and Safety and Commercial-Sales.

Related to the qualification level required in these occupations, participants avoid making a comparison using EQF levels, because most of the countries (Bulgaria, Germany and Spain) are in the process of building the national qualifications framework, not considering appropriate to establish such levels without an official endorsement in this allocation, although all project partners have agreed that the qualification of high qualified workers will be framed in levels 5-7 of EQF.

In response to the educational level required, it has been observed that university education (ISCED 6 and 5a) and higher VET (ISCED 5b) define the qualification framework of the high qualified workers in the sector. We found out that university education is not dominant in the qualification of the high qualified workers of the sector and the higher-level VET plays an important role in the development of the sector.

The qualification of each occupation is described in terms of learning outcomes (knowledge, skills and competence), which may be acquired through different means, such as formal learning in the educational system, work experience, and through non-formal (vocational training in the workplace) and informal learning (self-studies).

The acquisition of professional skills in the education system, including updating of knowledge and professional skill acquisition through training in the workplace, are essential elements in the professional performance. Also, attitudinal aspects of the qualification, social and organizational competences are essential factors for the adaptation of high qualified workers to the job posts, within a context marked by economic globalization and the constant changes resulting from technological innovation and work organization.

The description of those learning outcomes carried out in Food-fit project (<http://formacion2020.net/foodfit/>) reveals that the qualification acquired through work experience and other non formal and informal learning is fundamental for the development of work activity in companies. This description of professional qualifications in terms of learning outcomes can help to draw a sectoral framework of qualifications, which will facilitate mobility in the labour market and the transparency of professional qualifications.

The EQF reference in the Food-fit project will facilitate the implementation and development of the European Qualifications Framework (EQF) in the sector, and the use of this framework in the process of training and employment by public administrations, social agents, training centers, companies and workers.

8.6. Educational and training offer for high qualified workers

The food industry presents many educational challenges. The diversity of products and processes; the variable nature of the raw materials; food safety/health and safety/environmental regulations and the competitive pressures within the market place complexity have all contributed to the development of a dynamic manufacturing sector.

The industry itself has responded positively to these demands and has demonstrated the ability to embrace the necessary changes it has faced. A significant part of the successful response to change has been the emergence of new occupations and the enlargement of existing “traditional” occupations to deal directly with the many challenges faced by the sector.

These newly emerging and expanded existing occupations occur across all functional areas, and directly reflect the sectors dynamic responses to ever-changing demands for improved quality, food safety, variety and choice, and value for money.

Higher education offerings have responded appropriately to support the new and expanding fields of study. Traditional universities programmes and specialist colleges courses reflect enterprise-led demand. Vocational training plays a key role in the provision of the practical skills and knowledge needed by craft and high qualified worker grades within the industry.

From an institutional perspective, a consequence of the implementation of EQF in the European countries and the increased use of learning outcomes for defining and describing qualifications –promoted by the Bologna as well as the Copenhagen processes– is that it is calling into question traditional distinctions between higher education (HE) and vocational education and training (VET).

In the same way, the opinion of European employers stress the importance of focusing on learning outcomes in higher education as well as in vocational training. They consider it as a precondition for sustaining the employability of graduates, increasing the international attractiveness of the European Education Area as well as for strengthening the permeability between all sectors of education to make lifelong learning a reality (Eurobusiness 2007).

8.7. Final conclusion

The implementation of EQF and the development of national qualifications frameworks in the European Union countries will facilitate the development of sectoral frameworks in the various productive sectors of the European Union.

The Food-fit project proposals are intended as a reference for identifying the sectoral framework of qualifications of workers with high qualification level in the food industry. The methodology used has been attended by experts of the sector from different countries, representing a link between the results achieved with the socio-economic and labour situation in companies, and could be understood as a recognition of professional qualifications in the food industry in the European framework.

The use of learning outcomes, as descriptors of the professional qualification of workers with high qualification level, represents an important process for the merger of the different learning pathways in the areas of formal, non formal and informal education.

It seems very likely that the proposals for the Higher Education Strategy in Bologna - particularly motivated by the Dublin descriptors- and changes defined in vocational training systems to adapt to national qualifications frameworks draw a very beneficial scenery for the development of professional qualifications in the labour market. In this sense, the optimal fit methodology used, the description of learning outcomes and the tools proposed in the website of the project will contribute to facilitating professional guidance of workers with high qualification levels, and will help public authorities, social partners, training centres and companies to develop strategies for lifelong learning within the area defined by the European Qualifications Framework.

APPENDIX 1. EQF DESCRIPTORS

Descriptors to define the levels of the European Qualifications Framework³³

Concept and level	Knowledge	Skills	Competences
Concepts	In the EQF, knowledge are described as theoretical or / and practical.	In the EQF, skills are described as cognitive (use of the logical, intuitive and creative thinking) and practices (founded in the manual skill and in the use of methods, materials and tools).	In the EQF, competences is described in responsibility and autonomy terms.
Level 1	General basic knowledge.	Basic needed skills to develop simple tasks.	Working or study under direct supervision in a structured context.
Level 2	Practical base knowledge in a specific working field or study.	Basic needed cognitive and practical skills to use useful information to carry out tasks and solve common problems with the help of rules and easy tools.	Working or study under supervision
Level 3	Knowledge of facts, principles, process and General concepts in a specific working field or study.	Range of needed cognitive and practical skills to carry out tasks and solve problems selecting and applying basic methods, tolls and materials.	Responsibilities assumption
Level 4	Theoretical and practical knowledge in larges context in a specific working field or study.	Range of needed cognitive and practical skills to find solutions to specific problems in a specific working field or study.	Practice of self-management according to defined consigns in context of working or studying which use to be previewed, but susceptible of changing.
Level 5	Larger specialized knowledge, theoretical and practical in a specific working field or study, being aware of the limits of these knowledge.	Full range of needed cognitive and practical skills to find creative solutions to abstracted problems.	Management and supervision tasks in contexts of working or studied activities in which can be produce unforeseeable changes.
Level 6	Advanced knowledge in a working field or study which require a critic understood of theories and principles.	Advanced skills which prove the control and the innovation dowry which be necessary to solve difficult and non predictable problems in a specialized working or study field.	Activities management or technical or complexes professional projects, assuming responsibilities by taking of decisions in working or unforeseeable studies contexts.

³³ EUROPEAN COMMISSION (2008): *The European Qualifications Framework: a new way to understand qualifications across Europe.*

http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm

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Concept and level	Knowledge	Skills	Competences
Concepts	In the EQF, knowledge are described as theoretical or / and practical.	In the EQF, skills are described as cognitive (use of the logical, intuitive and creative thinking) and practices (founded in the manual skill and in the use of methods, materials and tools).	In the EQF, competences is described in responsibility and autonomy terms.
Level 7	High specific knowledge, some of them to the avant-garde of one specific working group or study, which set up the bases of an original though.	Critical aware of knowledge questions in a specific field and in the articulation point among different fields.	Specific skills to solve problems in the researching and investigation field, with views to the development of new knowledge and process, and into the integration of knowledge in different fields.
Level 8	Knowledge with the more advanced frontier of a specific working field or study and in the point of articulation among different fields.	Skills and more advanced and specialized techniques, particularly in the field of needed synthesis and valuation to solve critical problems of researching and / or innovation to enlarge and redefine knowledge and existing professional practices.	Authority, innovation, autonomy, academic and professional integrity and continuous engagement, sustains and accredited respect to the development of new ideas or process into the avant-garde of working context or studies, investigation included.

APPENDIX 2. EUROPEAN CV ELABORATED WITH FOOD-FIT TOOLS

Next, an example of the Curriculum Vitae created with the tool designed in the Food-fit Project is presented. It is an experimental CV that uses the Europass references (<http://europass.cedefop.europa.eu>) for describing the professional qualification of a food industry technician, identifying learning outcomes in the labour experience section.

You can find this tool in Food-fit web site:

<http://formacion2020.net/foodfit/distributor.php?lang=eu>



Curriculum Vitae Europass

Personal information	
First name(s) / Surname(s)	J.M.
Address(es)	Oliver Plunkett S Cork (Ireland)
Telephone(s)	+353 21 4276165
E-mail	JM@hotmail.com
Nationality	Irish
Gender	Male
Desired employment / Occupational field	Quality and Environment Technician.
Work experience	Quality and Environment Technician
Occupation held	
Job position held	Quality technician
Main functions and	Gathering and analysing information about the products, processes and services. Taking decisions about Quality and the Environment.
<i>Specific functions of the occupation or job position:</i> responsibilities	Quality control and microbiological analysis
Learning outcomes (knowledge, skills and	Knowledge <ul style="list-style-type: none"> To identify the legal and normative

<p>competences) acquired in the job position</p>	<p>requirements for product quality to ensure consumer safety.</p> <ul style="list-style-type: none"> ● To define the procedure for microbiological tests, and for drawing up the results. ● To set up processes required adapting a food industry to ISO standards.
	<p>Skills</p> <ul style="list-style-type: none"> ● To check the compliance of the legal and normative requirements for product quality to ensure consumer safety. ● To carry out microbiological tests, announcing the results. ● To apply the quality plan in accordance with company policy. ● To gather information, carrying out of tests and recording of results. ● To organize and to coordinate laboratory activities and the sampling plan, carrying out all kinds of tests and analyses on materials and semi-finished and finished products, geared towards research and quality control, interpreting the results obtained and acting in accordance with food standard practice in the laboratory.
	<p>Competences</p> <ul style="list-style-type: none"> ● Concern for order. To reflect an underlying drives to reduce uncertainty in the surrounding environment. ● Analytical thinking. To understand a situation, issue, problem, etc., by breaking it into smaller pieces, or tracing the implications of a situation in a step-by-step way.
<p>Name and address of company or employer</p>	<p>Guinness Brewery St James Gate Brewery, Dublin</p>
<p>Type of business or sector</p>	<p>11.05 Manufacture of beer</p>
<p>Education and training</p>	
<p>Qualification awarded</p>	<p>Food Production – Speciality</p>
<p>Principal subjects / occupational skills covered</p>	<ul style="list-style-type: none"> ● Food Chemistry and Packaging ● Food Microbiology ● Food Processing Technology ● Local Food Production Systems ● Managing Speciality Food Enterprises

- Nutrition and Sensory Science
- Risk Analysis
- Speciality Food Marketing and Distribution
- Speciality Food Production Assignment

Name and type of the education/training centre University College Cork

Level in national or international classification ISCED 5A First stage of tertiary education (Bachelor)
EQF7

Personal skills and competences

Mother tongue(s) **English**

Other language(s) **French**

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
	b1	Independent user (B1)	b2	Independent user (B2)	b1	Independent user (B1)	b2	Independent user (B2)	b1	Independent user (B1)

() Level of the Common European Framework of Reference for Languages (CEFR)³⁴*

Social skills and competences Initiative
Teamwork and collaboration

Organisational skills and competences

- Analytical thinking
- Organizational awareness
- Sets and works to meet challenging goals
- Team Leadership

Technical skills and competences

- Food biochemistry and chemistry
- Food Safety
- Food technology
- Quality control
- Team management

³⁴ Common European Framework of Reference for Languages: Learning, Teaching, Assessment (CEFR). http://www.coe.int/t/dg4/linguistic/cadre_en.asp

Computer skills and competences	Knowledge and use of Microsoft Office tools.
Driving license(s)	B, B1

APPENDIX 3. EXAMPLE OF SELF-EVALUATION OF QUALIFICATION

Here, a model for the self-evaluation of qualifications -created with the Food-fit project tool- is presented, making reference to learning outcomes as an essential element for describing qualifications.

You can find this tool in Food-fit web site:

<http://formacion2020.net/foodfit/distributor.php?lang=eu>

SELECTED OCCUPATION AND KNOWLEDGE AREA

- **Name of occupation.** Quality and Environment Technician.
- **Role of occupation.** Gathering and analysing information about the products, processes and services. Taking decisions about Quality and the Environment.
- **Knowledge Areas:** Food safety.

MY PROFESSIONAL QUALIFICATION. KNOWLEDGE, SKILLS AND COMPETENCES FOR WHICH THE USER IS QUALIFIED.

- **Knowledge** To know the procedures for operations where there are dangers of food contamination and those of the hazard analysis critical control point system (HACCP) for maintaining food safety.
- **Skills** To apply the application and follow-up of control procedures for operations where there are dangers of food contamination and those of the hazard analysis critical control point system (HACCP) for maintaining food safety.
- **Competences** Concern for order. To reflect an underlying drives to reduce uncertainty in the surrounding environment.

KNOWLEDGE, SKILLS AND COMPETENCES REQUIRED IN THE OCCUPATION BY THE LABOR MARKET. KNOWLEDGE, SKILLS AND COMPETENCES REQUIRED IN THE OCCUPATION BY THE LABOR MARKET.

Knowledge

To know the procedures for operations where there are dangers of food contamination and those of the hazard analysis critical control point system (HACCP) for maintaining food safety.

To identify the legal and normative requirements for product quality to ensure consumer safety.

To define the procedure for microbiological tests, and for drawing up the results.

To describe the procedure for using evaluation techniques for nutritional status, critical analysis and interpretation of results.

To describe the method for the implementation of recommendations of the Codex Alimentarius FAO/OMS.

To set up processes required adapting a food industry to ISO.

Skills

To check the compliance of the legal and normative requirements for product quality to ensure consumer safety.

To carry out microbiological tests, announcing the results.

To apply the Evaluation techniques for nutritional status, critical analysis and interpretation of results.

To develop the recommendations of the Codex Alimentarius FAO/OMS.

To use the processes required to adapt a food industry to ISO standards.

Competences

Conceptual thinking. The ability to identify patterns or connections between situations that are not obviously related, and to identify key or underlying issues in complex situations. It includes using creative, conceptual, or inductive reasoning.

QUALIFICATION I NEED TO OBTAIN. KNOWLEDGE, SKILLS AND COMPETENCES THAT THE USER SHOULD OBTAIN TO PERFORM THIS OCCUPATION.

Knowledge

- To identify the legal and normative requirements for product quality to ensure consumer safety.
- To define the procedure for microbiological tests, and for drawing up the results.
- To describe the procedure for using evaluation techniques for nutritional status, critical analysis and interpretation of results.
- To describe the method for the implementation of recommendations of the Codex Alimentarius FAO/OMS.
- To set up processes required adapting a food industry to ISO.

Skills

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- To check the compliance of the legal and normative requirements for product quality to ensure consumer safety.
- To carry out microbiological tests, announcing the results.
- To apply the Evaluation techniques for nutritional status, critical analysis and interpretation of results.
- To develop the recommendations of the Codex Alimentarius FAO/OMS.
- To use the processes required to adapt a food industry to ISO standards.

Competences

- Conceptual thinking. The ability to identify patterns or connections between situations that are not obviously related, and to identify key or underlying issues in complex situations. It includes using creative, conceptual, or inductive reasoning.

GLOSSARY

Competence means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy.

Formal Learning. Learning that occurs in an organised and structured environment (e.g. in an education or training institution or on the job) and is explicitly designated as learning (in terms of objectives, time or resources). Formal learning is intentional from the learner's point of view. It typically leads to validation and certification.

Higher education. All types of courses of study, or sets of courses of study, training or training for research at the post secondary level which are recognised by the competent authority of a State as belonging to its higher education system.

Higher education qualification. Any degree, diploma or other certificate issued by a competent authority attesting the successful completion of a higher education programme.

High-skilled occupations. Include a) occupations usually requiring university education, b) college education or apprenticeship training and c) management occupations (which do not always require postsecondary education).

Informal learning. Learning resulting from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning support. Informal learning is in most cases unintentional from the learner's perspective.

International sectoral organisation means an association of national organisations, including, for example, employers and professional bodies, which represents the interests of national sectors.

Knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual.

Learning outcomes means statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence.

Lifelong Learning means all learning activity undertaken throughout life, which results in improving knowledge, know-how, skills, competences and/or qualifications for personal, social and/or professional reasons (Cedefop, 2010).

National qualifications framework means an instrument for the classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims to integrate and coordinate national qualifications subsystems and improve the transparency, access, progression and quality of qualifications in relation to the labour market and civil society.

National qualifications system means all aspects of a Member State's activity related to the recognition of learning and other mechanisms that link education and training to the labour market and civil society. This includes the development and implementation

of institutional arrangements and processes relating to quality assurance, assessment and the award of qualifications. A national qualifications system may be composed of several subsystems and may include a national qualifications framework.

Non formal Learning. Learning which is embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's point of view.

Occupation. "Job" is defined as a set of tasks and duties executed, or meant to be executed, by one person; a set of jobs whose main tasks and duties are characterised by a high degree of similarity constitutes an occupation. Persons are classified by occupation through their relationship to a past, present or future job. (ILO).

Jobs. Jobs are contracts (explicit or implicit) between a person and an institutional unit to perform work in return for compensation (or mixed income) for a defined period or until further notice (OECD).

Qualification means a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards.

Sector means a grouping of professional activities on the basis of their main economic function, product, service or technology.

Skills means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

Vocational education and training (VET). Education and training which aims to equip people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly on the labour market.

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